THE MEDICAL JOURNAL OF AUSTRALIA

VOL. II.—40TH YEAR SYDNEY, SATURDAY, DECEMBER 26, 1953 No. 26

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SOME OBSERVATIONS ON TETANUS.[1]

By FRANK BEARE,
Adelaide.

THIS communication is based on a study of 58 cases of tetanus under my personal supervision at the Royal Adelaide Hospital. Since 1946 it has been the custom at this hospital to admit all patients suffering from tetanus, or supposed tetanus, under the care of the same physician. This policy still exists, it being thought that uniformity of treatment should result. In this series diagnosis was made mainly on clinical grounds, substantiated when possible by laboratory and other aids. While it is admitted that the above standard lends itself to error, it is submitted that errors in diagnosis should not be very frequent, as tetanus presents such a clear clinical picture.

In South Australia the majority of patients with tetanus of and over the age of twelve years, from both urban and rural sources, are admitted to the Royal Adelaide Hospital. By the same token, most of the patients aged under twelve years are admitted to the Adelaide Children's Hospital. Therefore, admissions to the former hospital in the age group twelve years or over should show the variations in the incidence of the disease in this State.

[1] Read at a meeting of the South Australian Branch of the British Medical Association on May 28, 1953.

Since 1900, 295 patients suffering from tetanus have been treated at the Royal Adelaide Hospital, with 137 deaths—that is, with a mortality rate of approximately 46%. Dr. Alderman will later on this evening give you comparable figures from the Adelaide Children's Hospital.

By reference to Figures I and II it will be seen that the incidence of tetanus increased from about 1930 onwards, and that the mortality rate decreased from 1935 onwards. This increase in incidence resulted mainly from a rise in the population of the State, but also from improved facilities for the transportation of patients from rural areas to the city for treatment. In this series some patients were flown hundreds of miles to Adelaide for hospital care. Naturally such journeys could not have been undertaken in the "horse and buggy" days of the earlier part of this century. Unfortunately, the actual incidence of deaths from tetanus in South Australia is not available from any official source.

Ætiological Factors.

In considering such a disease as tetanus it is most important to give thought to the natural history of the infecting agent, the *Clostridium tetani*. This organism is widespread in Nature, occurring in spore form in soil, manure and decaying material, and also in the intestinal tract of many living creatures, including man. The organism is anaerobic in its habits, and the spores resist many of the more commonly employed means of sterilization. If the foregoing is borne in mind, it is easy to

understand that a penetrating wound acquired in dirty surroundings and healed on its more superficial aspect should be ideal for the growth of any *C. tetani* implanted in its depths. The more so would such a wound be suitable for the growth of the organism if any foreign material such as a splinter of wood or a particle of mud was included, for it would appear that any necrotic process such as may be expected to arise in the vicinity of such a foreign substance helps the growth of tetanus organisms. Table I shows the probable site of infection in this series. It will be seen that punctured wounds were found in

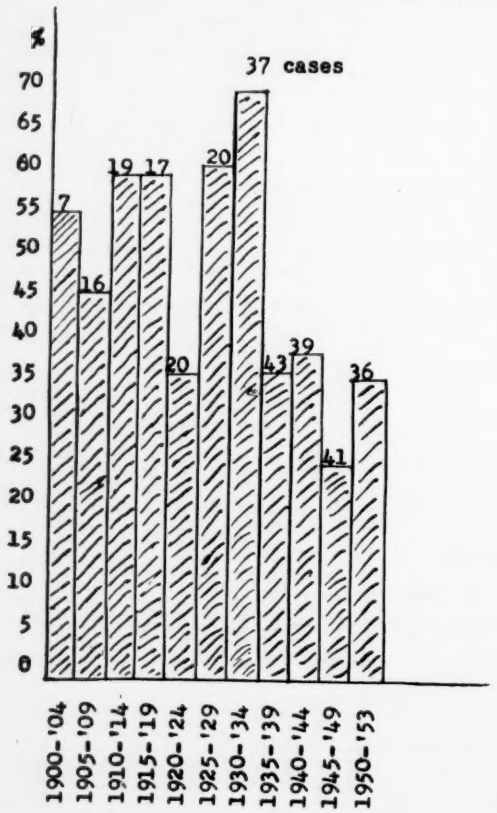

FIGURE I.

17 cases, and further, that the majority of injuries occurred on the limbs. Positive cultures of *C. tetani* were obtained from 14 out of the 21 wounds that were examined bacteriologically.

Table II shows that the cases in this series were fairly evenly spread over the age groups over twelve years, and that males were about twice as likely to contract the disease as were females. The mortality rate was definitely greater in those of both sexes aged over sixty years.

It is interesting to observe that in this series only one example of tetanus in ex-service personnel was encountered.

Clinical Features.

The clinical features of tetanus are so well known that it is not necessary to go into any great detail in regard to them, except to emphasize the fact that early diagnosis and so early treatment is essential for the achievement of good therapeutic results. It is superfluous to say that to await the onset of tetanic spasms before commencing treatment is to invite disaster.

In this study almost the only constant clinical sign was trismus, which might be termed the sign manual of tetanus. This manifestation varied in degree from an absolute inability to separate the lips to a minor difficulty in opening the mouth. No case of constantly local tetanus without trismus was encountered, and usually the latter was observed early in the course of the disease. Dysphagia of varying intensity was observed in about half the cases and as an early sign. In some cases the mere sight of a drink would bring on a tightening of the throat muscles. This reminded one of the celebrated incident occurring in the early days of the settlement of Van Diemen's Land, when two surgeons came to blows over the differential

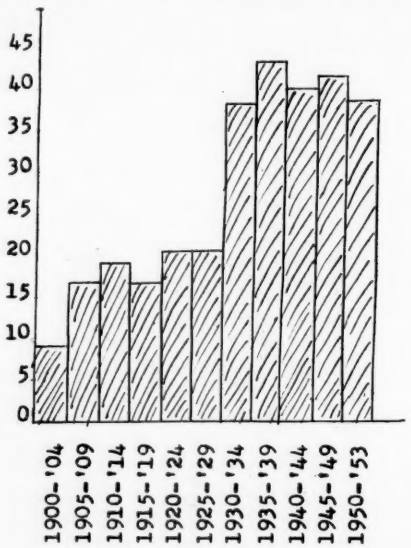

FIGURE II.

diagnosis between hydrophobia and tetanus in a certain young patient. Sweating was almost invariably present, even in the winter months, and the presence of this sign proved to be more valuable diagnostically than fever, which was absent in the earlier stages of the disease in about half the cases.

Another sign of undoubted value was the presence of persistent tightness of the abdominal muscles. This feature was found in the majority of cases and was usually of a board-like nature, very reminiscent of that felt in a patient with a ruptured peptic ulcer. This rigidity was usually not accompanied by pain or tenderness, and, fortunately for the diagnostician, occurred quite early in the course of the disease. On occasion it was possible to punch the owner quite hard on the abdomen to his apparent amusement. So much for the earlier manifestations of the disease, and to summarize it may be stated that the presence of trismus with sweating, dysphagia and rigid abdominal muscles almost certainly means that a diagnosis of tetanus is justifiable.

Except in certain fulminating cases, tetanic convulsions as distinct from constantly present tightened muscles were not an early feature of the disease. On occasion these spasms did not manifest themselves until many days had elapsed from the onset of the initial earlier signs. In fact, the period of development—that is, the interval of time elapsing between the first evidence of the earliest signs and the onset of the first convulsion—will be referred to later as of significance in the prognosis of the disease. Of the 58 patients observed, some 18 failed to manifest any convulsion during their illness. The classical *risus sardonicus* occurred in a number of cases, but never as an early sign, and the same may be said of general muscular rigidity of a persistent nature. Other later manifestations that may be mentioned were retention of urine needing catheterization (10 cases, all in males) and diplopia lasting some days (four cases).

In those instances in which lumbar puncture was performed, nothing of significance was found in the cerebrospinal fluid.

Treatment.

General.

It is submitted that the formulation of a plan of treatment is very necessary in the management of a case of tetanus. It is essential that the patient be nursed in a quiet darkened room, sound-proofed if possible, and by experienced members of the staff, who realize that it is important for the patient to be protected from all but unavoidable sensory stimuli. Planning should minimize the number of injections given, the number of visits made by the medical attendants, and the number of ministrations by the nursing staff. Over-zealous treatment leads only to more spasms and so more exhaustion, which after all is one of the main causes of death in this disease.

TABLE I.

Probable Site of Infection.		Number of Cases.
Cuts in limbs		11
Burns on limbs		4
Chronic ulcers		5
Punctured wounds (limbs)		17
Contusions		5
Abrasions		5
Discharging ear		1
Surgical wound:		
Nephrectomy	1	
Orchidectomy	1	
Miscarriage	2	
Bone graft	1	8
Abdominal incision	2	
Removal of foreign body in throat	1	
Unknown		2
Total		58

As dehydration from sweating is to be anticipated, the intake of fluids should be sufficient to combat this eventuality. Fluids may be given by the mouth by various tube feedings and, if these are not possible, by means of an intravenous drip administration. When the drip method is used, care should be taken that the needle is firmly fixed in the limb so that it is not disturbed should the patient have a spasm. As far as is possible, suitable fluid, foods and drugs should be given by the same means and at the same time as the saline or other solution. In this regard subcutaneous or rectal administration of fluids is not indicated, as being too irritating to the patient. Generally, if the patient is not able to swallow, the passage of a tube into the alimentary tract, even if possible, irritates the patient too much, so it is preferable to use intravenous therapy.

Specific.

It is essential that tetanus antitoxin be given as soon as possible. In this series Commonwealth Serum Laboratories tetanus antitoxin was administered in every case except one. As a principle, a dose thought to be suitable for the whole course of the disease was given on the patient's admission to hospital and not repeated unless there was some very good reason for so doing. It has been shown that an effective "cover" lasting for several days follows a suitable dose, and that this is enough to neutralize any fresh toxin produced and circulating in the blood. As a basic dose 100,000 international units were given intramuscularly with 100,000 such units by the intravenous route. On no occasion was the antitoxin given intrathecally. Every patient was tested for sensitivity before the foregoing treatment was carried out, and this phenomenon was found to be present in about one-sixth of the series so tested. The following test for sensitivity and method of desensitization was employed:

About 0·2 cubic centimetre of tetanus antiserum was injected intradermally. If no weal developed within ten minutes, the patient was regarded as being insensitive to tetanus antiserum. If a weal developed, a further 0·2 cubic centimetre was given subcutaneously, then 0·4 cubic centimetre subcutaneously after twenty minutes, and then the remainder of the dose intramuscularly after a further twenty minutes' wait. The intravenous dose, if any, was given slowly immediately after this.

Whether the foregoing procedures are sufficiently stringent or not may be questioned; but the fact remains that no example of immediate reaction to antitoxin was encountered. The same cannot be stated with regard to delayed reaction, for in 31 out of 39 patients who lived long enough to develop such a response, this was seen. This serum sickness consisted of a widespread, very itchy, erythemo-urticarial rash, usually appearing between six and eight days after the administration of the antitoxin. In some cases this was accompanied by pyrexia lasting some days, and on occasion by effusion into the joints and, in two instances, by widespread œdema and loss of tendon reflexes. The use of various antihistamine drugs both prophylactically and therapeutically failed to influence its course; but adrenaline given subcutaneously did seem to alleviate the rash somewhat.

TABLE II.

Age Incidence by Decades and Sex Incidence. Fatal Cases in Parentheses.

Age. (Years.)	Males.	Females.	Total.
10 to 20	9 (1)	2 (—)	11 (1)
21 to 30	5 (1)	1 (—)	6 (1)
31 to 40	6 (2)	2 (2)	8 (4)
41 to 50	5 (1)	5 (1)	10 (2)
51 to 60	5 (—)	2 (—)	7 (—)
Over 60	9 (6)	7 (4)	16 (10)
Totals	39 (11)	19 (7)	58 (18)

Treatment of the Wound.

As soon as practicable, the wound or wounds most probably leading to the infection were dealt with. This treatment was carried out after the administration of the antitoxin, the reasoning being that it was desirable that antitoxin should be readily available to counteract any toxin set free by the surgical interference with the wound. In addition, whenever possible, the site of operation was blocked off by antitoxin given locally into the surrounding tissues, doses of up to 40,000 international units being used for this purpose. In a number of cases the site of infection was difficult to find; but Table I will give some idea of the distribution. It was kept in mind that the *C. tetani* is an anaerobe, and therefore all foci of infection were widely opened up and *débridement* was carried out. In some cases it was necessary to amputate fingers and even limbs. It was remarkable how often such a foreign body as a splinter was recovered, even when the patient was adamant that all such material had been removed at the time of the injury or shortly after. In one patient with infection following a miscarriage, hysterectomy was performed; this patient died. But as tetanus arising from such a focus is almost invariably fatal, it is suggested that such a line of attack, if carried out early enough, might give more hopeful results.

Penicillin was used as a routine to inhibit the growth both of *C. tetani* and of the other organisms found in a "dirty" wound. The usual procedure was to give doses of the order of 500,000 units of aqueous penicillin with 300,000 to 600,000 units of "Procillin" immediately, and follow this by a similar dose of "Procillin" every twelve hours. This *régime* was continued for some seven to ten days or so, depending upon the nature of the case. In this series no other antibiotic was used.

Sedation.

Sedatives of the barbiturate group were used almost invariably, the object being to keep the patient in the

active stages of the illness continuously drowsy. Phenobarbitone in doses varying from one to two grains every six hours or so was given by the mouth. If the patient was unable to swallow, this drug in three-grain doses was given intramuscularly every eight hours or so. In a few cases "Pentothal" was given intravenously to tide the patient over a difficult phase, or while some disturbing procedure was being carried out. As far as could be ascertained, the above-mentioned drugs did not embarrass respiration in any way. In addition, morphine or pethidine given subcutaneously was often used to relieve the pain of the spasms and, it was thought, with benefit and with no disturbance to respiration. In no case was "Avertin" used, it being thought that drugs given *per rectum* would not be retained. Of the antispasmodics used, paraldehyde proved to be the most useful when given either by the mouth or intramuscularly in doses of the order of eight to ten millilitres.

Of the drugs acting as muscular relaxants, only "Myanesin" was used, and in doses of one gramme in ten millilitres of water given intravenously in one dose. The results obtained in the 11 cases in which this preparation was employed were variable. In some instances appreciable muscular relaxation was obtained, so that nearly normal feeding could be carried out. In such cases this therapy was repeated about every eight hours or so until the need for its use was no longer present. In other cases no appreciable relaxation was obtained and its use was abandoned. It has been suggested that "Myanesin" given slowly through an intravenous drip apparatus gives better results—this method was not employed in this series. Several instances of thrombosed veins were observed when a portion of the "Myanesin" solution leaked out into the soft tissues of the elbow. One case of hæmoglobinuria following "Myanesin" therapy was encountered; the details are as follows:

A farm hand, aged nineteen years, was admitted to hospital on November 11, 1950. The history was that a stiff neck had been present for six days and pain in the back for twelve hours. There had been no difficulty with swallowing and there was no record of any injury. He had been given 100,000 units of tetanus antiserum and then flown 200 miles to Adelaide. On his admission to hospital he had trismus and tetanic spasms every few minutes, the temperature was 100·2° F., and the abdominal muscles were rigid. A few small cuts were noted on his hands. He was treated with 100,000 international units both intramuscularly and intravenously, and with procaine penicillin 300,000 units twice daily. Three grains of phenobarbital were injected every eight hours. The hands were cleaned up and his bladder had to be catheterized, no abnormality being detected in the urine. In addition "Myanesin" (one gramme) was given intravenously every eight hours or so. On November 12 he was still having repeated spasms if not heavily sedated. On November 13 he was worse, being irrational, and his urine was of a port-wine colour and contained much albumin and reacted to the chemical tests for blood, but no red cells were found. At this period he had received six grammes of "Myanesin"; this was stopped. The next day he was maniacal, but his spasms had ceased and the urine was normal. On November 21 he was still confused. His cerebro-spinal fluid pressure was 200 millimetres of water, but the constituents of the fluid were normal. The urine was normal, but the blood urea nitrogen content was 100 milligrammes per 100 cubic centimetres. On November 23 his conduct was still erratic and the blood urea nitrogen content was 90 milligrammes per 100 cubic centimetres. On November 27 he was better, his blood urea nitrogen content was 40 milligrammes per 100 cubic centimetres, and he had an absolute amnesia for his "rowdy" fortnight.

In this series no other muscular relaxants were used.

Tracheotomy.

One of the main dangers to be avoided in the treatment of tetanus is respiratory embarrassment, with or without respiratory tract infection and pulmonary collapse. Often during the course of spasms the air passages become constricted, and this leads to cyanosis and on occasion to generalized epileptiform seizures. Many of the foregoing dangerous features can be avoided by performing tracheotomy. Indeed, in some instances this operation may be regarded as a life-saving procedure.

In this series tracheotomy was performed on nine patients, only two of whom died; all nine were severely affected and had convulsive spasms. So good have been the results that this treatment has been carried out more often in the later cases of the series than was done in the earlier ones (that is, from 1946 to 1950).

Prevention of Tetanus.

With the proper use of the prophylactic measures now available, there is no reason why tetanus should not become a rare disease, and even when it does occur, run a more benign course than it does at present. The success in the case of diphtheria obtained by the use of similar methods is known to all, and it is even suggested that more people in Australia die of tetanus than of diphtheria. That passive immunity is usually obtained by the use of tetanus antiserum is known to all; but this valuable measure is not always used even in incidents that should lead the medical man to suspect the likelihood of tetanus developing subsequently. Thus only eight out of the 58 patients in this series received tetanus antiserum prophylactically. Again, very often the dosage used is inadequate. The procedure recommended by the Commonwealth Serum Laboratories serves as an excellent guide and is reproduced below. It should be remembered that the present international unit is of the same strength as the "U.S.A." unit.

> In the following paragraphs is discussed the protection of a person who has not on any previous occasion received a course of Tetanus Prophylactic (formalinized toxoid) for Use in Humans, that is to say, a person who has never been actively immunized against Tetanus.
>
> In order to prevent the development of Tetanus when such a person is wounded, one should inject a dose of Tetanus Antitoxin (Globulins, refined and concentrated) as soon as possible. If the wound be an ordinary cut or clean laceration, a dose of 1,000 units (U.S.A.), either for an adult or a child, should suffice, but if the wound is severe, such as a compound fracture, or if it is contaminated by soil or dung, or if it is a punctured wound, or if it may contain a foreign body, one should give at least 1,500 units (U.S.A.).
>
> If there has been delay in the administration of the prophylactic dose, that dose should be increased. For instance, if more than 48 hours have been allowed to elapse since a severe wound was inflicted, 3,000 units (U.S.A.) should be given.
>
> On rare occasions Tetanus spores may lie latent in the tissues for a number of days or weeks, becoming active and dangerous at the end of that time. Since Tetanus Anti-toxin is eliminated in two or three weeks, a single dose cannot confer protection for any longer period. Therefore, to maintain a high degree of protection after a severe wound, one should give a further dose of 1,500 units (U.S.A.) ten days after the initial prophylactic dose. Indeed, if suppuration still continues in the wound, a third dose of 1,500 units (U.S.A.) ten days after the second may also be advisable.
>
> If one intends to operate on tissues among which Tetanus spores from former wounds may lie latent, a dose of 1,500 units (U.S.A.) should be given on the day preceding the operation.
>
> The subcutaneous route is the route of choice for all prophylactic doses.

Even in 1914 the value of tetanus antiserum was shown in the British Expeditionary Force in France. In September, 1914, tetanus developed in 9 per 1000 wounded, while by December of the same year, after the routine use of tetanus antiserum, this figure had dropped to 1·4 per 1000 wounded. The method recommended was to give four doses of 1000 "old international" units of tetanus antiserum at seven days' interval, it being thought that sensitivity to tetanus antiserum would not have developed by seven days.

More recently active immunization by means of tetanus toxoid has been practised and with great success. During World War II practically all members of the Empire and United States forces were so immunized, and for all practical purposes tetanus in the wounded of these forces ceased to be a problem. The routine used was variable, but usually two injections of one cubic centimetre of tetanus toxoid were given at six weeks' interval, followed by a "booster" dose of one cubic centimetre of tetanus toxoid one year

later. It is probable that it takes about six months after the initial dose of tetanus toxoid for sufficient antibodies to develop, but that the rise in these protective substances after the "booster" dose is extremely rapid. It has been recommended that a further dose of one cubic centimetre of tetanus toxoid is all that is needed after an injury when documentary evidence is available that the patient has been satisfactorily immunized within the previous five years. While this evidence should be available from service personnel, it is unlikely that civilians would be able to supply the necessary proof. In cases of doubt it is recommended to give both tetanus antiserum and tetanus toxoid at the time of injury, and further it is advised that the tetanus antiserum should be given in one area and the tetanus toxoid into another site—for example, into opposite arms and from separate syringes.

In civilian practice it is regrettably rare to find a person who has had toxoid. It is interesting to note that most, if not all, medical students who have observed a case of severe tetanus at once demand toxoid. An earnest plea for more widespread active immunization is made, especially amongst those people whose occupations expose them to the hazards of tetanus—that is surely most of the population. Tetanus is one of the most horrible diseases that the doctor has to treat.

It would appear that an attack of tetanus does not produce immunity of any length of duration. Second attacks of tetanus do occur, if rarely; but the odds against getting a second attack are so great that this is not surprising. One instance was observed in this series.

On July 27, 1948, a woman, aged forty-six years, was admitted to hospital with a history that she had had a stiff neck for four days. The day after this onset she could not open her mouth, and on the day of her admission to hospital she had a severe headache and difficulty in swallowing and in speaking. Examination of the patient on her admission to hospital revealed that she had a temperature of 99° F., trismus, severe stiff neck, and rigid sterno-mastoids and abdominal muscles. There was a scabbed sore on the nose and the cerebro-spinal fluid was normal. She was given 100,000 international units of tetanus antiserum both intramuscularly and intravenously and sedated with phenobarbital, one and a half grains every six hours. The course was benign with no spasms, and all rigidity had disappeared by August 10.

On March 9, 1953, she was readmitted to hospital with a history that for the last three days she had been unable to open her mouth and had a stiff neck and difficulty in swallowing. Examination of the patient on her admission to hospital revealed that she had a temperature of 99° F., trismus, and rigid neck muscles and sterno-mastoids. She had an infected cut on one finger. She was treated with 100,000 international units of tetanus antiserum intramuscularly, but none intravenously, and with soluble penicillin in one dose of 300,000 units followed by "Procillin", 300,000 units twice daily for a week, and sedated with phenobarbital. Again the course was benign, she had no spasms, and all rigidity had disappeared by March 31.

It is worthy of note that *C. tetani* was not recovered from either wound.

Prognosis.

In the past, as regards tetanus, it has been stated that, other things being equal, the shorter the incubation period, the worse the prognosis. In this respect it is submitted that in many cases it is impossible to estimate the incubation period—that is, the time elapsing between the infection and the onset of symptoms.

In a number of cases, if the life history of the organism is borne in mind, the clostridium implanted at the time of the injury may be dormant for varying periods of time until some suitable change in the environment stirs it into activity and the production of toxin. Thus a chronic ulcer of the leg may be innocuous for months as far as producing toxin is concerned and then, either as the result of the seeding on it of tetanus spores or by activation of long-present organisms, it may burst into malignant activity and so produce clinical tetanus. For the foregoing reasons it is suggested that the incubation period as a prognostic guide has a limited value.

On the other hand, the period of development—that is, the time interval between the onset of the first muscle stiffness, usually trismus, and the noting of the first phasic spasm is of the greatest value. When this period is of twenty-four hours' duration or less, death is almost invariable. Figure III will show that in this series 100% of such rapidly developing cases were fatal and that as the period of development increased, so did the mortality rate decrease, and that this figure had dropped to nil when this period had increased to six days.

Again, the absence of tetanic spasms is of the most favourable of prognostic signs, for the absence of these seizures usually indicates that the patient will live. In this series 16 patients out of 40 exhibiting phasic spasms died, while only two patients out of 18 not so affected perished. Of the last two patients who died, one was an enfeebled, aged diabetic and the other had severe bronchopneumonia proven at autopsy and died on the seventh day of her illness.

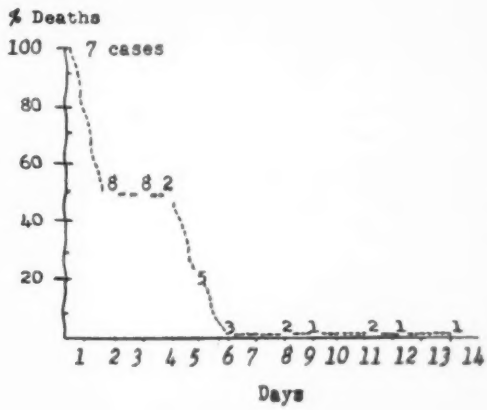

FIGURE III.

The age of the patient undoubtedly plays a part in the prognosis. Table II shows that tetanus is particularly lethal in those aged over sixty years. In this series of this age group 10 patients out of 16 died.

The prophylactic administration of tetanus antitoxin at or soon after the time of injury undoubtedly influences both the incidence and the course of the disease without always preventing its onset. In this series only eight patients were thus treated, the illness of all ran a relatively benign course, and all recovered. It would appear that the administration of tetanus toxoid is effective even years after its last use. Only one ex-member of the services appears in this series. The details are as follows:

A man, aged twenty-six years, a boot clicker by trade, was admitted to hospital on December 20, 1950. The history was that he had had a stiff jaw for two days, and that about nineteen days previously he had cut his finger at work. He had been given no tetanus antiserum, but had had a grafting operation performed on his finger. He had served in a crack infantry unit during the war and been discharged in early 1946. He said that he had always been given toxoid when it was due. Some, but not complete, documentary evidence to prove his statements was obtainable, but there was no reason to doubt this former non-commissioned officer's remarks. Examination of the patient revealed trismus and risus sardonicus but no abdominal stiffness. He received no tetanus antiserum, but one cubic centimetre toxoid, and "Procillin" (300,000 units) twice daily for a week, and his suppurating distal phalanx was removed. *C. tetani* was grown from this wound, and this organism killed a guinea-pig in the required time. The patient had recovered completely by January 12, 1951, and was discharged from hospital.

Summary.

1. A study of 58 cases of tetanus at the Royal Adelaide Hospital is recorded, the mortality rate being 31%.

2. Tetanus may occur at any age, but is most common and most severe in the young and the aged.

3. Trismus, rigid abdominal muscles, dysphagia and sweating are the most commonly observed features of the disease in its early stages.

4. A carefully planned line of treatment is more effective than a haphazard one, and skilled nursing is a very potent factor in achieving recovery.

5. A plea is made for early passive immunization with tetanus antiserum and for active immunization with tetanus toxoid.

6. The duration of the incubation period is regarded as being a less reliable prognostic guide than the period of development.

7. Examples of hæmoglobinuria following "Myanesin" therapy, a second attack of tetanus in the same person, and tetanus of aural origin are recorded.

SOME ASPECTS OF THYROIDECTOMY AND THE THYROID NODULE.

By J. K. MOWAT, M.S.,
Chief Assistant to the Professor of Surgery, University of Queensland.

IN an analysis of 200 cases of thyroid disease selected at random from the recent files at the Brisbane General Hospital there were ten instances of primary Graves's disease.

In Brisbane, primary hyperthyroidism, or exophthalmic goitre, is relatively uncommon, whereas small and medium-sized nodular goitres are seen very frequently. Thyroidectomy is a commonly performed operation, but it is often difficult to ascertain in a particular case what indications there have been for it. Therefore, students tend to acquire a muddled outlook on this whole subject, and even to allow at times an abrogation of their traditional right to question. This may be because they sometimes receive vague answers, or unclear answers which they fail to comprehend, or, alternatively, because we who are there to instruct them are so uncertain in our minds about the story, or so unconvinced, that we fail to fix their understanding.

It is my opinion that students should be well schooled along conservative lines in this subject, for it is unpropitious that they should emerge into the world believing that weight loss means thyrotoxicosis or that hysterical turns are an indication for partial ablation of a gland that is slightly uneven in its contours.

It is presumably acceptable that there should be a clear and easily stated reason for performing any operation. Let us discuss, then, the various indications for thyroidectomy.

Thyrotoxicosis: Overt and Latent.

The diagnosis of thyrotoxicosis rests in the main on the following indications.

1. Weight loss in the presence of a good appetite. Weight loss as such is without diagnostic value, because it occurs in many cases of maladjustment and anxiety neurosis, which are the chief disorders one is called upon to distinguish from thyroid overaction. On the other hand, in some instances of unequivocal hyperthyroidism there is no falling off in condition at all, because the stimulation of appetite by the increased metabolism is sufficient to result in no calorific deficit.

2. A warm, moist skin—not sweating of the palms particularly, because this is a well-known feature of an anxiety state. Lahey (1951) states that he can estimate the basal metabolic rate with some accuracy by the feeling of warmth in the body skin. Moreover, the skin tends to be soft and velvety to the feel.

3. A stare and fixity of expression. This, however, is often absent and is a feature of Graves's disease rather than of toxic adenoma.

4. The eye signs. If exophthalmos is present it is more or less apparent as a visibility of the white sclera both above and below the iris. Special tests are not of great clinical use. Upper lid retraction is to be distinguished from exophthalmos. It is said to result from sympathetic overactivity and may be seen in any type of hyperthyroidism, whereas true protrusion of the orbit is implemented by an excess of circulating pituitary thyrotropic hormone and so is a feature of the primary disease only (see Figure I). It is to be borne in mind that many people have prominent eyes as a familial trait, so that some caution is needed before any momentous conclusions are reached.

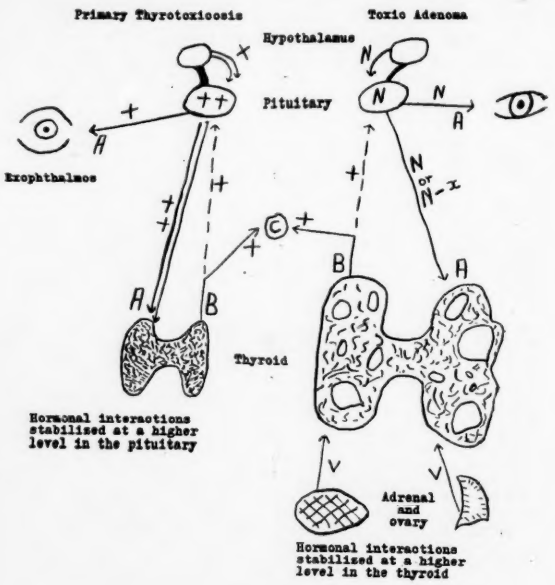

FIGURE I.

A, thyrotropic hormone; B, thyroglobulin; C, blood-stream; N, normal; V, variable. Interrupted line, inhibitory action.

For example, I recently had referred from the casualty department a man who had reported because his young daughter had bitten him on the ear; he was thin and nervous and had eyes like a Pekinese poodle, and the isthmus of the thyroid was palpable over the upper rings of the trachea. This man was so worried over the fortuitous disclosure of serious constitutional disease that he presented at the surgical out-patient department with a tremor and tachycardia, so that three students decided he was undoubtedly a candidate for surgery. But his skin was dry, the tremor was coarse, the gland was soft and not really enlarged at all, and, although he had lost a little weight, his appetite had been unusually poor since the onset of some worries in his business. Finally it transpired that his ocular configuration was inherited from his forebears, was even more noticeable in one of his brothers, and was in some measure observable in the daughter who had bitten his ear.

5. A fine tremor of the fingers. This, of course, is by no means pathognomonic, because many people have a fine tremor, and a coarser type of tremor is commonly seen in various anxiety states. However, the absence of any tremor is evidence against thyrotoxicosis. Lahey (1951) speaks at some length about tremor in the toes, stating that the toes are affected much less than the fingers in anxiety neurosis, but just as much in hyperthyroidism. I do not usually test the toes for tremor, but the sign is probably one of some value.

6. Tachycardia. A raised pulse rate is a classical feature of these disorders; but it has to be recognized that in some cases of toxic adenoma the pulse rate is little if at all above normal, especially in elderly thyrocardiacs, whereas quite pronounced tachycardia is seen in numerous ailments, both

mental and physical, as well as in normal individuals. As a means of differentiating all these instances of tachycardia from that of thyrotoxicosis, the sleeping pulse rate is usually regarded as of outstanding value. Certainly its estimation should never be omitted in equivocal cases, but I am doubtful about how much reliance is to be placed upon it. Some people sleep excitingly because they dream, or doze fitfully in semi-conscious uncertainty, or toss about in never-ending conflict with their bed-clothes, while others vegetate in imperturbable slumber. The physiology of sleep is not understood.

7. The reaction to weather. This is well known and valuable evidence, but interrogation on the subject might well be more searching than it is. For instance, a history of a change of attitude toward the summer weather is surely of great significance.

8. Goitre. I once heard it said by a busy doctor with a bent for thyroidectomy that the thyroid gland weighs four grammes and is normally impalpable, and that if it is palpable it is too big and its bigness should be remedied forthwith by skilful surgery. This is a sorry state of affairs, not only academically, but for the patients who report with faith seeking relief from their illness.

I regard the thyroid gland as being normally palpable in most necks. Certain it is that a palpable organ is not necessarily enlarged to a pathological degree. The stage at which abnormal enlargement may be said to be present is a matter for judgement and clinical experience, and the decision is wrapped up to some extent with a consideration of the firmness of the glandular tissue.

The thyroid in primary Graves's disease is classically described as moderately enlarged and firm, and this firmness of the gland is important and very real. When the goitre is nodular, likewise, it is not likely to be giving rise to toxicity if there is no firmness about its substance. A gland that is not enlarged at all is most unlikely to be functionally overactive, and cases of "masked thyrotoxicosis" should be viewed and reviewed with great circumspection. Some people, however, especially those in the later age groups, such as elderly thyrocardiacs, are extremely difficult to assess when small and rather soft nodular goitres repose deep in hoary necks.

9. Special tests. It is recognized by most observers that the basal metabolic rate is anything but a reliable guide in primary diagnosis, because increases of 40% and 50% can occur in anxious and apprehensive subjects. Repeated readings are said to be much more useful, and if they give a figure below +20% one is inclined to avoid a confident diagnosis of hyperthyroidism. However, the test is used less than it has been, and I have under treatment at present—with thiouracil—a man suffering from severe and undoubted Graves's disease whose basal metabolic rate has always been about normal.

The exhibition of therapeutic medicaments for a short period of time to ascertain what effect these may have on the patient's sense of well-being, or upon the pulse rate and tremor, is a method of investigation which would seem on the surface to be full of great promise. But it is extraordinary, and most noteworthy, how patients will claim to be improved and, indeed, actually appear to be objectively improved when all other evidence and subsequent events indicate that organic disease has been absent. Nevertheless, this method of investigation should not be entirely ignored, for patients are different one from another, and there are undoubtedly cases in which this evidence will be the deciding factor in the final diagnosis. It must be remembered, of course, that the thiouralene drugs and mercaptoimidazole tend to cause an increase in the size of the thyroid gland, whether it is functionally abnormal or not, so that care is needed in reassessing the patient after a course of treatment with these agents. I have heard of several thyroids being removed after artificial hyperplasia had been induced by thiouracil, the enlarged gland then becoming the dominating factor in the diagnosis.

The blood cholesterol level is, in my opinion, of no value in the diagnosis of hyperthyroidism. No doubt it tends to be low, but not especially low, and even in florid cases it is not very far below the normal reading. In myxœdema, on the other hand, and parenthetically, the blood cholesterol level rises very steeply, and values twice and three times the normal of 200 odd milligrammes per hundred mils are not unusual.

Estimations of the serum content of protein-bound iodine and of the radioactive iodine uptake of the thyroid gland are tests which are not performed here as yet in other than an experimental way. The latter may prove to be the ultimate in scientific diagnosis, against which all other methods are measured, in that it is purely mathematical, and under these not improbable circumstances one may perhaps speculate upon the diminution in the number of thyroidectomies to be performed in the future. The serum protein-bound iodine estimation sounds as though it should be very valuable indeed; but it is a complicated test and subject to technical errors, and a recent series in England would seem to indicate that it is unreliable (de Mowbray and Tickner, 1952).

During the last few years many patients with primary Graves's disease have been managed conservatively by the prolonged exhibition of "goitrogenic agents", such as thiouracil and its compounds and 2-mercaptoimidazole. The outcome of these semi-experimental procedures is yet to be estimated, and a spate of current literature is extant for those who wish to read it; suffice it to emphasize here that there are certain differences of a fundamental nature between primary hyperthyroidism and toxic adenoma. In the primary disease the onset is much more rapid, often following some form of psychic trauma, and in an earlier age group, and usually it is much more florid as to the manifestations of somatic hypermetabolism; there is a tendency to exophthalmos, and the goitre itself is as a rule of moderate size, smooth, and quite firm. Finally, Graves's disease occurs fairly often in men.

All these things hold in the opposite for toxic adenoma, and it may be added that the results of surgical treatment in the latter disorder are superior to those in the former. To account for these observed phenomena various concepts have been advanced which are partly hypothetical and partly in accord with experimental findings. Figure I is a diagrammatic representation of such a concept, which may be said to have some merit in simplicity.

All in all, the diagnosis of thyrotoxicosis in other than florid cases is not easy. More than anything else it requires self-discipline in the allocation of significance to the various signs and multitudinous symptoms, for, unlike nearly all other surgical diseases, the diagnosis is not confirmed or refuted at operation, and so there is no salutary chastening of the surgeon by unexpected pathological revelations. The differential diagnosis is to be made from anxiety state, which, apparently, is a very common state for people to be in, but which, unfortunately, requires the attentions of social psychologists or political economists rather than the mundane endeavours of the surgeon.

There are, of course, a number of other features of this disease over and above those already considered which are quite important in that they occur, but which are not important diagnostically. Palpitations of the heart, dizzy feelings, nervousness, hot flushings of the skin and the like are subjective manifestations on which it is completely futile to base a surgical diagnosis, in the absence of anything else. Menstrual irregularities are a common accompaniment of well-developed hyperthyroidism, but surely must be anything but diagnostic in borderline cases. Fatigue, asthenia, quadriceps insufficiency and thyrotoxic myopathies are well known and described in the literature, but need not concern us here.

It is my opinion that the diagnosis of thyrotoxicosis is made too frequently and on insufficient grounds.

Thyrotoxicosis, Possible, Probable, or Anticipated.

Thyrotoxicosis, possible or probable, appears to be a popular reason for performing thyroidectomy, and I have frequently heard it said that all nodules of the thyroid will inevitably become toxic sooner or later. This declaration is surely a little bit wild. Nodular goitres of many years' duration are frequently seen, if looked for, amongst patients

who present with other ailments and who are no more thyrotoxic than anyone else in the community. Nevertheless, it is to be borne in mind that paroxysmal auricular fibrillation and other forms of thyrocardiac disease are often most insidious in their onset, and dangerous, and eminently curable by surgery, so that it behoves one not to minimize the importance of nodularity of the thyroid gland in people of advancing years. The proposition that prophylactic surgery is reasonable has never been convincing to me, and my policy has been to have these patients attend periodically for review.

Pressure Phenomena and Cosmetic Considerations.

In the main, the pressure and cosmetic aspects of thyroid disease are straightforward, but there are some points worthy of note and a few views that are conflicting.

1. In physiological enlargements of the gland such as occur at puberty, and in small soft colloid goitres due to minor degrees of iodine deficiency, patients often complain of a sense of fullness in the throat and of slight difficulty in swallowing. This is usually regarded as functional and due to worry about the "goitre"; but it occurs so frequently that I think it must have an organic basis. The neck is a sensitive part, and a slight pressing recently acquired may well cause mild discomfort. Nevertheless, these glands have enlarged in order to supply an added demand by the body for thyroglobulin, so it is surely unreasonable to slice away large sections of the struggling organ.

2. Small to medium-sized solitary nodules, smooth and soft in consistency, are commonly found at the junction of a lobe and isthmus. They are readily visible because of their site, but the pressure they cause is minimal. If it is decided to deal with one of these nodules for cosmetic reasons, or because the patient cannot help worrying about it, or because her neighbours and her friends insist repetitiously that it is malign in its aspect, then it may well be removed locally without any confused trepidations in the mind of the surgeon that nine-tenths of the remaining normal thyroid tissue should be sacrificed with it. The question of the pre-malignancy of lesions such as this is discussed below.

3. Larger nodular goitres may constrict the throat in a manner that demands relief, or be so big as to be grossly unsightly, or grow caudally beneath the sternum so that spontaneous intracystic hæmorrhage presents even a danger to life. The incidence of the development of insidious thyrotoxicosis in these goitres is discussed above; I think it is a fairly accurate observation that the firmer these glands are in consistence, the more likely they are to become toxic. In any case there is ample indication for advising surgery.

4. Riedel's struma or ligneous thyroiditis is a well-known entity which is mentioned here for the sake of completeness. It is anything but common, but when it does occur it presents generally with the symptoms of neck constriction. It is small and very hard and smooth, and the operative treatment, when the severity of the constriction calls for it, consists in division or wedge resection of the thyroid isthmus.

5. The *struma lymphomatosa* of Hashimoto is very different from the foregoing, because it is fairly large and diffuse, and not at all hard and more or less asymptomatic, so that the diagnosis is not often made clinically. If it is so made, or suspected, irradiation is the treatment of choice; but whether this lesion is irradiated or surgically ablated, or merely kept under observation, some degree of myxœdema usually follows. It is not uncommon.

6. Giant cell thyroiditis is different again. It is associated with pain and often some fever, the enlargement of the gland is quite pronounced, and it is firm and fairly tender. The treatment is irradiation in appropriate dosage.

Neoplasia.

Much has been written of recent years on the subject of the "solitary nodule" as a potentially malignant lesion, and some of the more startling of the American figures creep up towards 30% (for example, Coffey *et alii*, 1950; Colcock, 1951; Soley, Lindsay and Dailey, 1948; Shallow *et alii*, 1952; Cole, Slaughter and Majarakis, 1949).

This solitary nodule is said to be somewhat more dangerous in men than in women, because in men it is likely to be indeed solitary, and adenomatous from the beginning (see paragraph 4 below). Moreover, nodules in men are uncommon, as these glands are not subject to the repeated hyperplasia-involution cycles, so that when one is found it is of undoubted significance. But even in women the figures given for malignant potentiality range from 15% to 25%.

With regard to multiple thyroid nodules, a very modest quote of between 4% and 7% is usually made for the incidence of malignant or pre-malignant change.

All this bears thinking about. American statistics are heavy with the weight of great numbers and are not lightly to be brushed aside. But there would appear to be fallacies somewhere, and the following aspects of the subject may be thought about.

1. The ætiology complex of goitrous disease is poorly understood, but there is a considerable geographical variation in incidence and in the dominant type of pathology. Statistics drawn from American populations, therefore, are not necessarily applicable to other places.

2. Thyroid carcinoma is a very uncommon disease. Surgeons in the United States of America hold that this is not so. They explain, with a facility that is rather attractively ingenuous, that these unhappy sufferers retreat to the privacy of their homes, where they languish and quietly expire without the benefit of an accurate diagnosis. This can hardly be said to hold in Queensland, where every citizen has a right to expect alleviation and succour in his demise, and from a doctor whose background of training is such that he knows with some measure of accuracy the initiating factors in his patient's departure.

Some surgeons in Australia, while admitting that thyroid carcinoma is indeed uncommon, attribute the dearth of cases to the vigour of prophylactic surgery. This surely, and to say the least, is naïve. Large numbers of people with small goitres never go to a doctor, many more go to a doctor but refuse to take his advice, and then there are many doctors who do not advise surgery anyway, because they have not read the American literature or because they have a kind of feeling that the lump in the neck is not serious at all despite the gloomy forebodings of the pundits.

All in all, there is something unreal about these high percentages, something which the untrained man in the street would find unacceptable without being able to say why. It is odd, then, that they seem to be acceptable to scientific minds. Or are they really acceptable? Or, in any case, will they continue to be acceptable?

Warren H. Cole *et alii* (1949) conclude the summary of a comprehensive article thus:

> The incidence of cancer in the solitary type of nontoxic nodular goitre is so high in our locality that we advise removal of all solitary nodules, but perform subtotal hemithyroidectomy rather than enucleation because early cancer will be found unexpectedly in a surprisingly large number. During the past four years we have advised and removed practically all solitary nodules encountered in patients in our clinic, but in spite of this the ratio or per cent of cancer has not decreased over that encountered in our initial series reported four years ago.

Such a statement may well have some significance.

3. Thyroid histopathology is anything but simple—and perhaps herein lies much of the fallacy of this matter. There is but one ultimate criterion of malignancy, and that is the macroscopic evidence of invasion and metastatic spread. Papillary formation and equivocal indications of venous plugging may perhaps be not of overwhelming importance, and what pathologist will be prepared to argue that the details of cytology are a proper basis on which to build the concept of a whole disease process? In the series of 200 unselected cases mentioned above as taken from the recent records of the Brisbane General Hospital,

134 operations were performed for nodular goitre which was either non-toxic or "? mildly toxic". The reports on the histopathology of these 134 specimens contained 22 instances of the use of phrases which are held to indicate an early or established neoplastic process, such as "papillary formation", "papillary adenoma", "pre-malignant papillary structure" and "early malignancy" (in one only). This figure, which works out at about 17%, tallies surprisingly well with the overseas figures quoted above, and is perhaps an indication of the accuracy of histopathological observation in the various centres of learning. However, the interpretation of the observations is another matter. Papillary structure in the thyroid appears to stand like an ecclesiastical edifice, shrouded somewhat in a vague macabre mystery and calling for the unquestioning faith of the true believer. But the mantle of faith rests awry and unbecomingly on scientific shoulders.

4. It should be mentioned finally, on the subject of nodules, that nodules single clinically prove very frequently to be multiple at operation. This fact seems to be inadequately faced by nearly all writers, although Bears and Judd (1951) are an exception when they declare with laudable humility that they find it "impossible to establish clinically the fact that a nodule is single".

By all this it is not meant to imply that there is no such disease as thyroid carcinoma. There certainly is; but it should not be tangled ætiologically with hyperplasia and involution lumps, any more than cystic hyperplasia of the breast should be merged pathologically with the scirrhous tumour. I wish to plead, rather, that minor irregularities in the contour of the thyroid gland are not an indication that the patient is on the verge of destruction by invasive growth, and also that in the majority of cases the most likely situation is that they are not causing the symptoms complained of. If it is considered after careful assessment that they are indeed causing these symptoms, then the justification for surgery is clear.

Conclusion.

In essence, then, and to summarize, I think in all cases of supposed thyroid disorder it behoves us to be accurate in our diagnosis, very clear in our minds when weighing the benefits to be expected from operation, and at least inquisitive, or in search of a truth yet unrevealed, on the contentious subject of prophylactic surgery.

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BILATERAL NECK DISSECTION WITH EXCISION OF BOTH INTERNAL JUGULAR VEINS AND RELATED MATTERS.

By E. S. MEYERS,

Faculty of Medicine, University of Queensland.

IT is stated in American literature that reports of bilateral jugular interruption are meagre and most are found in otolaryngological journals. So far as I am aware there is a similar dearth of reports in Australian medical literature, and it is thought that some account of the procedure of block dissection of the neck with removal of the internal jugular veins may be of interest to practitioners generally.

The following case was reported in the Report of the Royal Commission (1931):

> A married man, aged 65 . . . was suffering from cancer of the mouth.
>
> On the 22nd August, 1930, he was treated in the Radium Ward . . . .
>
> On the 26th September . . . operation on the right side of the neck was performed by Dr. Meyers in the presence of a number of surgeons who were Fellows of the Royal College of Surgeons.
>
> It was agreed during consultation that a further operation on the left side of the neck was advisable.
>
> This operation was commenced and continued for a period of half an hour or thereabouts without interruption or misadventure . . . the operation further continued without any unfavourable conditions being noted for ten or fifteen minutes when the surgeons present noticed for the first time that the patient's condition had undergone an unfavourable change. His face became deeply cyanosed, his breathing and pulse were feeble; he collapsed almost immediately; his breathing ceased and the heart action ceased some seconds later. The usual and proper attempts at resuscitation were made but the patient did not recover and life was pronounced extinct.
>
> Some hours after the patient's death a post-mortem examination was made . . . and death was certified as due to
>
> (1) Anæsthesia,
>
> (2) Operation on the neck, and
>
> (3) Syncope.

A Royal Commission was appointed by the Queensland State Government to inquire into the cause of death and created much interest at the time.

> During the course of the Inquiry a good deal of stress was placed on the question as to whether or not the left internal jugular vein had been actually ligated at the time of the collapse of the patient.

The Royal Commissioner in his report to the Government made the following statement:

> There is some conflict in the evidence on this point but in my view it is not very material to the Inquiry.
>
> If it were in fact ligated, there is abundant evidence that it is a recognized surgical operation. Dr. R. A. Meek, for some years Senior Honorary Medical Officer at the Brisbane General Hospital, stated in his evidence that he had himself several times ligated both jugulars, and that such was a recognized operation. On being pressed, he stated that he had ligated both jugulars twice or three times. As Dr. Meek said, "With a patient with cancerous glands of the neck, the only chance you have got is a thorough removal of them all if it can be done . . .".

The Royal Commissioner in his final judgement made the following statement:

> I find that the death of the patient was not caused by the negligence or incompetence of any person or persons . . . . I find the cause of death was as set out in the Certificate, namely (1) Anæsthesia, (2) Operation upon the neck, (3) Syncope. . . . I find that the deceased was suffering from malignant cancer in the Glands of the Neck, for which the appropriate remedy was a radical operation. It was a justifiable operation to prolong his life only attempted after careful examination by and consultation between experienced medical men. The actual operation, so far as it had gone, was performed skilfully and without any negligence.

Much evidence was given about what would be likely to happen when both internal jugular veins are removed. The experience of Crile, particularly his paper which appeared in 1923, was produced in evidence, and attention was drawn to the following statement made by him:

> In advanced cases, no matter where the primary lesion, a wide regional block excision is demanded. Complete bilateral excisions can be made with an interval of several weeks without fear of ill results, the easiest technique involving excision of the sterno-mastoids and of both jugular veins *en masse* with the lymphatics. The

disfigurement is not striking; and since the adoption of this method in 1898-1899 we have rarely missed securing a permanent cure in any case which had not progressed beyond the lymphatic planes of the neck.

Since Crile's article was published there have been few references to the subject; but in the article by Gius and Grier (1950) a full account not only of the venous supply, but also of the effect of ligating both jugulars is given.

In this article we read the following statements:

> The venous system of the head is a complex network consisting of intracranial, extracranial, and interosseous divisions. Communications are abundant, the venous pressure is low, and reversal of flow easily occurs. The intracranial and extracranial portions communicate freely through the emissary and diploic veins, the large

FIGURE I.

Showing line of incision and reflection of fascia over sterno-mastoid.

> venous plexuses on both sides of the skull base, the veins of the orbit, and the veins of the neural and arterial foramina . . . . This complex intercommunicating system of veins extends from the cranium to the coccyx. Normally the vertebral veins are not of great physiologic importance, but following venous obstruction they become a major by-pass. The vertebral venous system is composed of the internal vertebral plexus, the external vertebral plexus, and the communicating veins. The entire system is united by many small irregular channels, and at each vertebral space the vertebral veins are in communication with the intracavitary veins of the thorax and abdomen, the intercostal veins, and other veins of the body wall.

Gius reported the following findings:

> In all cases . . . varying degrees of edema of the face was observed. Edema of the face gradually receded during the immediate postoperative period but some permanent puffiness of the face persisted in most cases . . . . Facial discoloration from a pink to a cyanotic hue was common immediately following operation but regressed more rapidly than did edema. Severe headache often persisted for several days. Later, headache would recur if the head were placed in the dependent position. Most individuals preferred to sleep with the head elevated . . . .
>
> Although the adequacy of the communicating channels of the head and neck were not determined preoperatively in the present series this would seem to be a logical procedure. The remaining jugular could be compressed without disturbing the deep cervical veins. At this time subjective and objective observations could be made . . . . If evidence of severe venous insufficiency were found consideration should be given to sparing the second jugular. Even though intermittent or continuous compression of the jugular may favorably influence flow through the collateral channels and aid the venous adaptation preoperatively, the hazard of lymphatic or venous extension of the disease would seem to preclude the use of this procedure.

Part of the summary and conclusions of this article is as follows:

> 1. The venous system has a remarkable ability to adapt to bilateral removal of the jugular system. In the head the adjustment involves the intracranial, communicating, and extracranial venous elements. In the neck the vertebral plexus of veins appears to be the principal by-pass after removal of the jugular system.

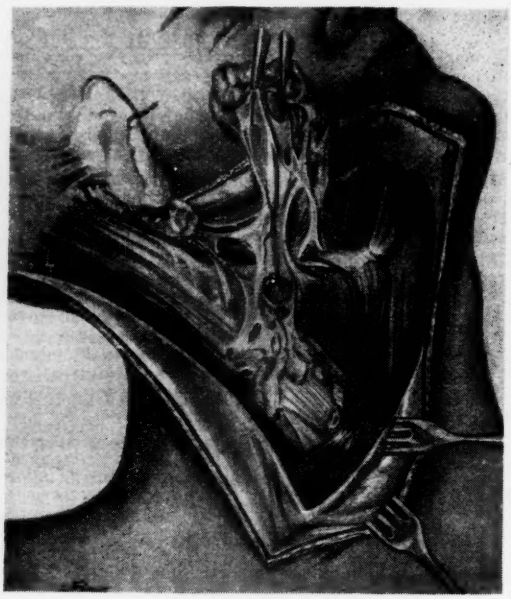

FIGURE II.

Showing removal of fascia from submaxillary triangle.

> 2. Removal of the second jugular system is followed by partial decompensation of the venous circulation. This is manifested by edema and discoloration of the face, headache, and inability to maintain a horizontal position. As venous adaptation occurs various degrees of compensation return. A permanent "fat face" may be expected in some cases.
>
> 3. The effect of bilateral jugular removal on cerebrospinal fluid pressure cannot be stated on the basis of these observations but in this series no serious alterations were noted.

A very useful discussion followed the reading of this paper. B. Ray reported as follows:

> We have been catheterizing the sagittal sinus through a burr hole just in front of the hairline, and through that catheter injecting a contrast dye, Diodrast, and taking X-ray pictures showing the filling of the venous system . . . . We find that in normal individuals there is considerable variation . . . dye introduced here will go down only one jugular system and does not get into the other one at all, indicating that in many people there must be a dominance of the venous drainage on one side . . . . That being the case, if one were concerned about avoiding the symptoms and signs that Dr. Gius has related to you, he might consider leaving the jugular on that side or, if he were bolder, he might even put in a vein graft.

J. Modlin said:

> At the Ellis Fischel Cancer Hospital twelve bilateral total neck dissections had been performed during the past ten years. In six of these patients the internal

jugular vein was removed bilaterally. These were staged procedures with an average interval between operations of at least four weeks. Although there was no immediate operative mortality in this group of six patients, as was indicated by Dr. Gius, there was a rather alarming immediate postoperative edema of the face, conjunctiva, and laryngopharynx necessitating the maintenance of a tracheostomy opening for periods up to three weeks. Because of this, the internal jugular vein has been preserved on one side in the last six bilateral total neck dissections . . . .

H. Royster reported as follows:

We have had five patients who have had the same operation, the earliest one about four years ago . . . . I can say the same symptoms occurred. The first signs of swelling were very alarming.

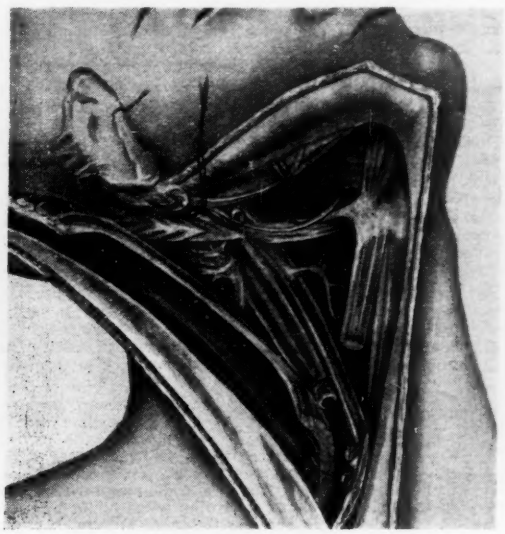

FIGURE III.

Showing commencement of removal of sterno-mastoid and internal jugular vein.

Since then we have been doing more tracheotomies for the usual radical sections, and I see Dr. Gius does the same, we compress the neck very tightly with a bandage, and even after the first radical neck dissection there is a great swelling of all the tissues above the dressing, and alarmingly so at first.

O. B. Batson said:

In a series of phlebograms obtained following the injection of a roentgenopaque medium into forearm veins, I found that often the injected material fails to reach the superior vena cava from the subclavian vein. Instead it leaves the subclavian vein through several channels to reach the lower cervical vertebral plexus of veins and progresses to the thoracic cavity through the vertebral plexus. I assume that the patients held their breath as instructed, perhaps even strained a little. This increased the intrathoracic pressure and prevented the flow into the superior vena cava.

These phlebograms showed that the vertebral venous plexus was much more than an emergency network. It is used as a pathway from the head and neck and the upper extremities every time we forcibly hold our breath. Those doing lifting and straining, miners and freight handlers, for example, should have better developed vertebral vein anastomoses than sedentary workers, and should be disturbed less by the acute ligation of the jugular veins . . . .

The edema reported must be similar to that which follows when both the venous and the lymphatic drainage is blocked. Razor cuts and burrowing ulcers of the neck may give edema of the face. In breast resections the removal of axillary lymphatics with the ligation of the axillary vein is generally followed by a lymphedema of the upper extremity distal to the field of operation.

The anatomy of the venous system is favorable for bilateral jugular vein ligation, and after the paper of Dr. Gius and the discussion evoked it would seem there need be no great fear of ligation of both internal jugular veins when conditions demand.

O. H. Baehrs and G. L. Jordan, junior, of the Mayo Clinic (1952), gave two case reports and made the following statements:

Because of the foregoing anatomic and physiologic facts and experiences of others, we have felt justified in proceeding with one-stage or two-stage bilateral radical cervical dissection for cervical metastasis. . . .

Therefore, radical operation on the neck, with sacrifice of both internal jugular veins, is justified when this procedure is indicated as part of the definitive treatment of

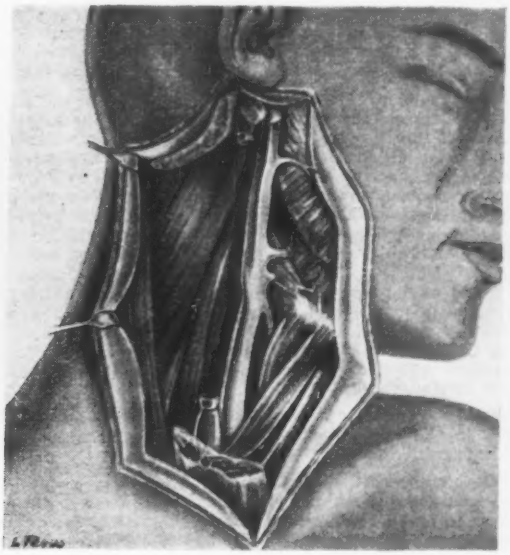

FIGURE IV.

Showing sterno-mastoid muscle, jugular vein and posterior belly of digastric muscle divided, and approach to the pharynx.

the lesion. Since the adequacy of the collateral venous circulation about the head and neck has been better understood, radical cervical dissection can be carried out without the dangers previously thought to be present when both internal jugular veins were removed . . . .

The operation of removal of the glands of the neck and internal jugular veins has been practised for many years. A notable exponent of it was Sir Herbert Maitland (1906). For cancer of the lips, tongue, pharynx *et cetera* the treatment of the glands of the neck has almost been standardized.

Wilfred Trotter brilliantly performed operations on the pharynx, larynx and associated parts. After the introduction of radium he vacated the field in favour of radiotherapy.

For the treatment of cancer of the larynx and pharynx surgeons have again turned to surgery, and in the interval since the time of Trotter very great advances have been made in anæsthesia, antibiotics and the like.

Raven (1951-1952) has made the following observations:

Block dissection of neck lymphatics: this standard procedure is next performed and the following structures are removed—the platysma muscle and the deep fascia from the midline to the anterior border of the trapezius muscle, the sternomastoid, omohyoid, posterior belly of the digastric and stylohyoid muscles; internal jugular vein, upper and lower groups of the deep cervical nodes, and the retropharyngeal lymph nodes, taking care to remove the highest nodes in relation to the base of the skull . .

The removal of the sterno-mastoid *in toto* as a preliminary step greatly aids this procedure and gives ready access to the pharynx and larynx.

In an article published in 1952, Dunlop has shown what can be done by surgery for the treatment of malignant disease of these parts.

The following is a description of a suggested plan of operation based on the fascial arrangement in the neck.

An incision is made from the *symphysis menti* and follows the digastric triangle to reach a point over the insertion of the sterno-mastoid to the mastoid process. From about the middle of this incision another incision is made downwards in the neck, about two inches, and extending over the lower part of the sterno-mastoid muscle back to the posterior triangle of the neck.

Thus there are marked out three broad base flaps, which when turned back completely expose the region of the neck. Experience has shown that these broad base flaps have no tendency to slough and healing is satisfactory.

The next step is to incise the fascia covering the sterno-mastoid muscle throughout its length and reflect the two halves of the fascia so as to expose completely the sterno-mastoid muscle in the upper three-quarters (Meyers, 1952). (As an alternative, as is shown in Figure III, by removing the upper part of the sterno-mastoid muscle in the early stages the operation is greatly facilitated.) The sterno-mastoid muscle is then removed completely, the posterior sheath of the muscle in its upper three-quarters being left intact. This step should not only greatly facilitate the removal of the glands of the neck and the internal jugular vein, but also provides ready access to the pharynx. The posterior belly of the digastric muscle may be removed, and this step will simplify operation in the upper part of the neck and provide ready access to the glands that are deep to the parotid.

Crile's clamp can be used on the common carotid and also on the upper part of the internal jugular vein, and thus prevent bleeding.

The glands of the submaxillary triangle are removed in the usual way, and then, commencing from below, the fascia over the internal jugular vein and the lower and upper deep cervical lymph glands. If there is doubt that removal is not complete, radium should be left in the wound after the manner advocated by Sampson Handley in carcinoma of the breast. This applies particularly to the glands deep to the parotid.

The internal jugular vein is tied off above and the clamp removed. The clamp is next removed from the common carotid artery. If the pharynx or larynx has to be operated on, we now have a clear field and access to it is easy.

Although I have not performed this modification of removal of the glands, surgeons may think it worth while to try it.

The accompanying diagrams (Figures I to IV) illustrate the steps of the operation.

Acknowledgement.

I am much obliged to Miss L. Pegus, medical artist to the Medical School, University of Queensland, for the drawings.

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Reviews.

The Basis of Clinical Neurology: The Anatomy and Physiology of the Nervous System in Their Application to Clinical Neurology. By Samuel Brock, M.D.; Third Edition; 1953. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9½" × 6½", pp. 522, with 124 illustrations. Price: £3 15s. 3d.

THIS book is described by the author as a presentation of the anatomy and physiology of the nervous system in their application to clinical neurology. This is a fair description of the work, which forms a very useful contribution to the literature on neurology.

The book covers the anatomy and physiology of the nervous system from the simple reflex arc to the higher cerebral functions, and it does so in the reasonable scope of 483 pages. There is a useful bibliography at the end of the book, and the index is more complete than most.

At all stages the clinical application of neuroanatomy and physiology is stressed and the syndromes produced by lesions at various levels are described. However, the neuroanatomy involved in the appearance of abnormal neurological signs in disease is not discussed very fully and the author makes no claim to presenting a method of neurological examination.

Sections on special investigations are included, such as the physiology and pathology of the cerebro-spinal fluid, a brief presentation of electroencephalography and electromyography, and cerebral angiography is also presented. There is a very brief description of ventriculography, but this section contains no reproductions of normal and abnormal radiograms obtained from cerebral ventriculography.

The book is well written and the print is clear and on good paper. There are many clear sketches of sections of the central nervous system and good diagrams of the chief nerve tracts, although more such diagrams could have been included and would enhance the value of the work.

This book can be recommended as a satisfactory basis on which a knowledge of clinical neurology may be built, but it is not intended as a reference book of neuroanatomy.

Basic Bacteriology: Its Biological and Chemical Background. By Carl Lamanna, Ph.D., and M. Frank Mallette, Ph.D.; 1953. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9" x 6½", pp. 692, with 100 text figures. Price: £5 7s. 6d.

IN the ninety-six years which have passed since Pasteur's first memoir was published expounding his evidence that lactic fermentation was achieved by a living multiplying agent, the science of bacteriology has travelled far and grown in its scope by leaps and bounds. Early text-books were descriptive, concerned with morphology and the problem of arranging conditions suitable for growth in the test tube. Bacteria which were associated with human disease presented a challenge to ignorance which set medical workers hot on the trail of the pathogenic bacteria. However, before long, the use of the single-celled organism growing under conditions which could be defined soon appealed to workers in chemical and physico-chemical fields, and thus bacteria became tools with which to attack a particular aspect of a problem perhaps far distant from the study of the bacterium itself.

So today we have arrived at a stage where many well-known laws of physics and chemistry have particular applications to the growth of bacteria, and further knowledge has been acquired in the application of them to different kinds of bacteria. Thus the text-book of bacteriology of the 1920's must differ fundamentally from that of the 1950's. Here is a book which is the result of collaboration between bacteriologist and biochemist, the full appreciation of which calls for a good grounding in physics and chemistry, and some knowledge of the techniques of bacteriology and virology.

The two professors have assembled most useful information and theory from a multitude of sources and have

focused it on the bacterium. The occurrence and taxonomy of bacteria, as the first chapter is called, states clearly the problem and overcomes a good deal of difficulty in taxonomy as well as recognizing how it arose.

The sections which follow on general properties—microscopy and staining—give laws and principles governing technical procedures which were empirical. The discussion of the Gram stain lists no less than 22 other differences between Gram-positive and Gram-negative bacteria.

The section on the growth of bacteria, which treats the subject from the mathematical as well as the biochemical and nutritional angles, is followed by a consideration of the enzymes of bacteria, physical factors and bacterial metabolism, and it is here that the full impact of the subject as it is today confronts the senior worker, calling as it does for a whole new language and appreciation of the physical mechanisms by which energy is made available for growth and reproduction. The final chapter is devoted to chemical disinfection which is discussed both qualitatively and quantitatively, and the mechanisms of action of the various bacterial poisons and inhibitors are examined.

This book will be invaluable in the hands of students, research workers and teachers, because it has assembled between its covers chapter and verse of many aspects of bacterial growth which hitherto have existed in widely diverse publications.

A Practice of Thoracic Surgery. By A. L. d'Abreu, O.B.E., Ch.M., F.R.C.S.; 1953. London: Edward Arnold and Company. 10" × 7¼", pp. 600, with 345 illustrations. Price: 80s.

THIS outstanding contribution covers the entire field of thoracic surgery. It is lucidly written, excellently illustrated and attractively published. It is reminiscent of, though less ambitious than, Sauerbruch and O'Shaughnessy's "Thoracic Surgery" (Edward Arnold, 1937). It is easily the best work of its kind published since the war.

It is refreshing to note the emphasis placed upon essentials, a feature which brings the reader at once to grips with the problem. He is not confused by lengthy descriptions of controversial aspects. This would have been impossible for an author who had not wisely stored every moment of an extensive experience. Numerous short succinct case histories adequately illustrate the problems.

The changing thought and the progressive nature of the specialty are demonstrated by such as the relative relegation of thoracoplasty and the emergence of resection in tuberculosis, the revival of Heller's operation for cardiospasm, and the advances in cardio-vascular surgery. Throughout it runs the attitude of conservatism we have come to associate with British texts.

Surgical techniques have been clearly described. The general surgeon might have appreciated a more profuse illustration of these techniques. The thoracic surgeon cannot help but realize that the author has encountered and mastered all the difficulties.

The author has quoted freely from the work and writings of his colleagues and generously accords his thanks. The well-chosen bibliography includes the best that has been written on the subject.

There is little to criticize. Closed chest injuries, the injuries of civilian life, are discussed briefly in favour of a lengthy discussion on penetrating injuries. More attention might have been given to them. The very useful Carlen's anæsthetic tube receives no mention. Few would agree that 75% to 80% of bronchial carcinomata are visible through the bronchoscope. These are insignificant faults in an otherwise invaluable book.

Standard Values in Blood: Being the First Fascicle of a Handbook of Biological Data. Edited by Errett C. Albritton, A.B., M.D.; 1952. Prepared under the direction of the Committee on the Handbook of Biological Data, American Institute of Biological Sciences, The National Research Council. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical), Limited. 11" × 9", pp. 210. Price: £2 2s. 9d.

"STANDARD VALUES IN BLOOD" aims to provide an "unusually complete collection of data on blood". A formidable list of nearly 200 contributors and reviewers has produced material for the compilation of 101 tables and a very extensive bibliography carefully cross-indexed to indicate the origin of all the material presented in the tables. Clinical medicine has become progressively more dependent on laboratory investigations and the number of tests performed is continually increasing. A knowledge of the mean values, ranges of normality and physiological variations is essential in the interpretation of laboratory investigations, but is as a rule not readily available. This well-produced and comprehensive volume therefore fills a real need. It includes diagrammatic representations of the physiology of blood coagulation, the various blood group systems and the genesis of the formed elements of the blood as well as the mean values and 95% ranges of all the measurable variables. It may be contended that the values given are not necessarily applicable to countries other than the United States of America, but in most instances there is probably little regional variation. The inclusion of ranges of normality is a particularly helpful aspect of the tables, but it must be recognized that in most instances they have been determined on carefully selected subjects and by expert workers with precision instruments which are not available in most laboratories. Nevertheless the book is the most comprehensive yet produced and must find a wide range of usefulness in hæmatological laboratories and medical libraries.

The Single Woman. By Margery Fry; 1953. London: Delisle, Limited. 5½" × 4¼", pp. 44. Price: 2s. 6d.

IN the substance of a radio talk the author writes, at times very movingly, of the special difficulties of life for the woman who lives alone. She makes a plea for more civilized behaviour on the part of people whose attitude to spinsters is either slightly derisive or even contains something like rancour, to whom "she is either evading her natural duties or she is, and this is almost more unforgivable, unattractive". They disregard the fact that many women will never have the opportunity to marry, however ardently they may wish to fulfil their "natural duties". The necessity for the education of girls to develop other abilities besides that of homemaking is stressed. Some sound suggestions are made for helping the single woman to get the best out of life, including, when possible, the adopting of children. For society to frown on the latter seems to the author "a needless waste of the stores of potential love and care".

Annual Review of Medicine. Edited by Windsor C. Cutting and Henry W. Newman; 1953; Volume IV. Stanford, California: Annual Reviews, Incorporated. 9" × 6¼", pp. 462. Price: $6.00.

THIS is a first class publication dealing with the principles rather than the practical details of medicine. It is more deliberately thoughtful than the general type of annual review book, to which it should be regarded as complementary. Eighteen chapters deal each with one main aspect of medicine, the author being an accepted authority in the field. The policy of the editors is to discourage individual authors from attempting to cover the field of their chapter completely. They prefer "a thoughtful presentation, suitably subtitled, of that part of the field in which the author is most at home, plus a few concise paragraphs in which he reflects on other portions of the field". A good example is the opening chapter by William S. Tillett on infectious diseases; in fact, the chapter is devoted to the antibiotics and their present status, biological as well as therapeutic, current advances being reviewed briefly and critically. The subjects of the other chapters are diseases of the gastro-intestinal tract, of the cardio-vascular system, of the kidneys and of the reticulo-endothelial system, hæmatology, nutrition, allergy, neoplastic diseases, diseases of the female reproductive system, vascular diseases of the brain, psychiatry, diseases of the respiratory system, physical agents and trauma (including burns and freezing), radiology, and diseases of the bones and joints. A useful additional feature is an annotated list of reviews that have appeared in the year's medical literature. This book can be strongly recommended.

***The 1952 Year Book of Pathology and Clinical Pathology* (January-December, 1952).** Pathology, edited by Howard T. Karsner, M.D., LL.D.; Clinical Pathology, edited by Arthur Hawley Sanford, M.A., M.D.; 1953. Chicago: The Year Book Publishers. 8" × 5¼", pp. 400, with 164 illustrations. Price: $5.50.

THIS volume is made up of abstracts presented in a straightforward fashion, with sparing editorial comment, in two separate sections; that on pathology is edited by Howard T. Karsner, and that on clinical pathology by Arthur Hawley Sanford. The section on pathology opens with a chapter on general pathology, with subdivisions on infectious diseases, physical injuries, granulomatous disorders, neoplasia and miscellaneous material. The remaining chapters are con-

cerned with the cardio-vascular, hæmopoietic and respiratory systems, the alimentary tract and associated glands, the female genitalia and breast, the urinary system and male genitalia, the glands of internal secretion, the musculo-skeletal system, the skin, the nervous system and the eye. The section on clinical pathology has chapters on hæmatology, chemistry, bacteriology and biology, mycology, serology, parasitology, cytology, microscopy and apparatus. Both sections are freely illustrated. The volume provides a handy summary of the year's literature for the pathologist and a useful summary of current ideas in pathology for clinicians of various types.

The Medical Annual: A Year Book of Treatment and Practitioners' Index. Edited by Henry Tidy, K.B.E., M.A., M.D. (Oxon.), F.R.C.P., and A. Rendle Short, M.D., *B.S., B.Sc., F.R.C.S.; seventieth year; 1952. Bristol:* John Wright and Sons, Limited. London: Simpkin Marshall, Limited. 8½" × 6", pp. 556, with 51 illustrations, a few in colour.

FOR Coronation Year "The Medical Annual" sports a redesigned cover and new and larger type face. An additional topical feature included is an article on medicine in the reign of Queen Elizabeth by the distinguished medical historian, Charles Singer. For the rest, the editors, Sir Henry Tidy and the late A. Rendle Short, have brought together the usual helpful collection of current information. Most important medical and surgical subjects are concisely reviewed in alphabetical order with particular reference to papers published on the subject. As usual, occasional subjects receive fuller treatment, and this year these include cervical disk herniation and cervical spondylosis, diphtheria, epidemic hæmorrhagic fever and chronic rheumatic disorders. A number of valuable features are continued, which are, so far as we know, unique amongst annual medical publications, namely, the sections on medico-legal matters (with a separate section summarizing in some detail the *Corneal Grafting Act* of 1952) and on veterinary medicine in relation to human medicine, as well as the lists of new drugs and appliances and new books. The "Medical Annual" is essentially a clinical book. It is not intended to present the academic aspects of medicine, which are well covered in a number of other annual volumes. The practising doctor will find presented here concisely and critically most that he wants to know of the practical developments of the past year.

The 1952 Year Book of Endocrinology (January, 1952-*January, 1953).* *Edited by Gilbert S. Gordon, M.D.*, Ph.D.; 1953. Chicago: The Year Book Publishers, Incorporated. 8" × 5½", pp. 400, with 107 illustrations. Price: $5.50.

DEVELOPMENT in the field of endocrinology has been rapid and extensive in recent years, and it is not easy to keep the many aspects of the subject in perspective. The editor of this Year Book seems to have this in mind, and has presented his material accordingly. Notably, he has set aside a separate section for cortisone, ACTH and allied compounds and has ventured an evaluation of their place in practice. Another section is devoted to the endocrine treatment of neoplastic diseases, and in this is summed up the present position in relation to advanced mammary and prostatic cancer. The subject of sexual precocity is given a separate section because of the difficulty of grouping certain cases under a particular endocrine heading. Carbohydrate metabolism and *diabetes mellitus* also have their own section. Otherwise, the grouping is in relation to particular endocrine glands. The abstracts are drawn from a wide field of medical literature and are handled critically by the editor, who also contributes in his introduction a balanced consideration of the place of laboratory procedures in clinical endocrinology. The volume can be commended as a comprehensive guide to current views and developments in endocrinology.

Enzymatic Concept of Anaphylaxis and Allergy: And the Role of Eosinophils in Anaphylactic Reactions Related to Hormonal Alterations. By Z. Z. Godlowski, M.D. *(Cracow), Ph.D. (Edin.), M.R.C.P. (Edin.),* with a foreword by A. Murray Drennan, M.D., F.R.C.P.E., F.R.S.E.; 1953. Edinburgh and London: E. and S Livingstone, *Limited. 8½" x 5½", pp. 128, with twelve plates in colour* and five text figures. Price: 15s.

THIS is a very difficult book to review, for there is so much in it that is theoretical and controversial that too much space would have to be given for a fair appraisal of its contents. The author tries to demonstrate the involvement of the intracellular enzyme systems in anaphylactic reactions and the part played by cells which stain like eosinophile cells and also the pituitary adrenal response in anaphylaxis. Briefly the view is that when antigenic protein reaches and enters tissue cells it induces the formation of proteolytic enzymes, specific to the antigen protein, and the cells are thus sensitized. If at a later date the antigenic protein enters tissue cells, thus sensitized, the enzyme breaks it up to toxic proteoses and histamine which bring about the pathological changes seen in anaphylactic shock. The author's discussion is very much more complicated than this, for he brings in such factors as the effects of heparin, which he considers a constituent of most cells, of lipo-proteins and of the adrenal corticosteroids and pituitary factors. All this makes for very hard reading and the author's views on cell enzyme systems and the general biochemistry of cells would not be accepted by many biochemists.

About half of the book deals with eosinophile cells, both *true blood eosinophile and pseudo-eosinophile cells formed* physiologically or pathologically in various non-hæmatopoietic organs, particularly the intestinal wall, and *subsequently mobilized and shifted into the blood. The con*nexion between these pseudo-eosinophile cells and anaphylaxis and immunity is discussed at length. There *is much that is new and interesting in this section and* there are some very good coloured plates showing the eosinophile cells *in situ* and being formed in various tissues. *This section is well worth careful reading. While there is* much that is controversial and much that cannot be supported by present knowledge, the book will be interesting *particularly to pathologists.*

Books Received.

[*The mention of a book in this column does not imply that no review will appear in a subsequent issue.*]

"Renal Function: Transactions of the Fourth Conference, *October 22, 23 and 24, 1952, New York", edited by Stanley E.* Bradley, M.D.; 1953. New York: Josiah Macy Junior Foundation. 9" × 6½", pp. 190, with 47 text figures. Price: $3.50.

Contains papers and discussions on four subjects: ion exchanges between extracellular and intracellular fluids; cation exchanges in the renal tubular epithelium; ion transport across living membranes; water and ion movements across intestinal and renal epithelium.

"Multiple Myeloma", by I. Snapper, M.D., Louis B. Turner, M.D., and Howard L. Moscovitz, M.D.; 1953. New York: Grune and Stratton, Incorporated. 9" × 6", pp. 176, with 43 *illustrations. Price: $6.75.*

A study based on 97 cases of multiple myeloma personally observed by the authors.

"Ear, Nose and Throat Diseases: For Medical Students", by *William McKenzie, M.B., B.Chir. (Cantab.), F.R.C.S. (Eng.);* 1953. Edinburgh and London: E. and S. Livingstone, Limited. 8½" × 5½", pp. 268, with 95 illustrations. Price: 21s.

Written to suit the needs of the medical student, the aim of this book is to be interesting rather than exhaustive.

"Pathology for Students of Dentistry", by George L. Montgomery, T.D., M.D., Ph.D., F.R.F.P.S. (Glas.), F.R.S.E.; 1953. Edinburgh and London: E. and S. Livingstone, Limited. *8½" × 5½", pp. 316, with 133 illustrations. Price: 37s. 6d.*

Embodies the course of instruction in general pathology for dental undergraduates in the University of Glasgow.

"Illustrated Guide to Sex Happiness in Marriage", by Lucia *Radl, M.D.; 1953. London: William Heinemann (Medical* Books), Limited. 7½" × 5", pp. 96, with 56 illustrations. Price: 10s.

A short manual for those preparing for marriage.

"Progress in Venereology", by R. R. Willcox, M.D.; 1953. London: William Heinemann (Medical Books), Limited. 8½" × 6", pp. 206, with 36 illustrations. Price: 21s.

*A summary, with over 1700 references, of the more impor*tant progress in venereology which has occurred since World War II.

The Medical Journal of Australia

SATURDAY, DECEMBER 26, 1953.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: surname of author, initials of author, year, full title of article, name of journal without abbreviation, volume, number of first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

THE NUFFIELD FOUNDATION.

THE eighth report of the Nuffield Foundation for the year ended March 31, 1953, has been received. The Nuffield Foundation takes such a large part in the scientific activities of the British Commonwealth that this document should receive attention. Readers should perhaps be reminded of the objects of the Foundation which are as follows:

1. The advancement of health and the prevention of sickness . . . in particular . . . by medical research and teaching and by the organization and development of medical and health services.

2. The advancement of social well-being . . . in particular . . . by scientific research and the organization, development, and improvement of technical and commercial education including the training of teachers and the provision of scholarships and prizes.

3. The care and comfort of the aged poor.

4. The advancement of education.

5. Such other charitable purposes as shall be declared in writing (*a*) by Lord Nuffield in his lifetime, and (*b*) after his death by the ordinary trustees and the managing trustees.

The Nuffield Foundation has so far worked on two "five year" programmes. After this year, the Foundation will enter upon a new five-year programme. In the introduction, it is pointed out that the Foundation has been able to undertake matters of considerable magnitude, but the reader is reminded that size is not of itself a guide to future promise, and that most ventures of an experimental and promising kind grow from small beginnings. The Foundation's normal and proper preference, we are told, is for small initial grants, both because it is often at the early stage that help is most needed yet hardest to enlist, and also because a trial grant when success is still speculative has proved to be the most secure basis for larger commitments later on. The late John D. Rockefeller stated that "nothing great has great beginnings", and also that "money is a feeble offering without the study behind it which will make its expenditure effective". R. B. Fosdick is quoted as having stated that without unstinted expenditure of time, investigation and expert competence, nothing permanently constructive can be accomplished merely by the use of money. Expert philanthropy, especially in the main intellectual fields, is a highly specialized, arduous and complex business. Obviously, the carrying out of effective work in research or any other field demanding originality of thought depends on the finding of first class minds. This idea was developed in a recent discussion on education in these columns. There is no doubt that the Nuffield Foundation has done a great deal towards the discovery of first class minds in the British Commonwealth. We are reminded, in the introduction to the report, that the Foundation once declared that modern charity should not be hampered by "archaic limitations . . . or by a passion for fruitless administrative tidiness". It is stated that "safety first" has always been a bad motto for the kind of private and generous initiative which should inspire charitable trusts, and that to disclose too much order might hamper rather than enlarge that spirit. In the present day, when governmental aid is sought for all kinds of research and when research is fathered, as indeed it should be, by governments, we should do well to remember the words of this report, that trusts and foundations are a part and sometimes a financial mainspring, of voluntary action, and that it is often the function of the voluntary movement to sponsor minority opinions, which may be unpopular opinions, advocating or trying unorthodox actions. For that reason, and not from any doctrinaire obsession, the Nuffield Foundation is unrepentant in its repetition that freedom—which includes the freedom to make mistakes—is an important condition of adventurous voluntary action. This is of the utmost importance. Mistakes are inevitable, and where human beings are given freedom of action, mistakes will inevitably occur. The man to be feared is the man who declares that he does not make mistakes. If he is prepared to admit that he has erred in any particular respect, he is, on that account, to be more honoured.

During the year 1952-1953, the Foundation allocated three grants against the year's income which totalled £713,696, the largest sum in any of the Foundation's ten years of existence. Grants for research in the United Kingdom totalled £319,296, of which £155,686 was for biological research, £54,460 for sociological studies, and £109,150 for other scientific work. For research and "practical problems" £37,000 was allotted, and for research in the Commonwealth overseas £26,400. For fellowships and scholarships a further sum of £36,000 was set aside. For the National Corporation for the Care of Old People, the Foundation has promised £250,000 for the next five years, and under the Foundation's programme for research

on aging £25,000 is reserved for the Nuffield Gerontological Research Fellowship. It should perhaps be stated that the capital of the Nuffield Foundation amounts to £10,000,000. The Foundation also administers the Oliver Bird Fund of £450,000, which is held on trust as part of the auxiliary fund of the Foundation. This fund is devoted particularly to study of rheumatism, and during the current year grants amounting to £24,760 have to be met as well as a further sum from the income of succeeding years.

Details are given of the grants made for research in the United Kingdom; with these we need have no immediate concern. One section deals with research overseas within the Commonwealth. We read that one of the new grants is to the Australian and New Zealand Association for the Advancement of Science. This body receives a grant of £1200 a year for three years. It is interesting to note that a grant was made to Dr. D. E. Tribe, of the University of Bristol, to visit Australia in the summer of 1952 to discuss problems connected with the grazing habits of animals. A grant of £250 was also made for a visit to Britain by Professor A. Boyce Gibson, who was engaged at the University of Melbourne in a study of the relation between traditional religious assumptions and contemporary philosophical developments. No one can say that the Nuffield Foundation takes a restricted view of research which it wishes to subsidize. The "practical problems" with which the Nuffield Foundation is concerned have to do with the functions and designs of hospitals. The "sister body" of the Foundation, the Nuffield Provincial Hospitals Trust, has been sponsoring in association with the University of Bristol a study which could take into account simultaneously problems of efficient working and of design and construction of hospitals. This project has been studied for a period of four years and its report is not due for publication until the end of the present year. We read, however, that the approach towards planning which the report will advocate leads to a floor area per bed considerably less than is usual in current practice, while at the same time it gives a more efficient working unit. Experimental hospital works have been under construction in Scotland and Northern Ireland, and the capital cost of the design is less than usual and the wards are also expected to show a reduced running cost. It is thought that other types of building might be profitably studied on similar lines. We read that what the Nuffield Provincial Hospitals Trust investigation has shown to be true of hospital buildings seems to be true also in other fields. The pattern of work which the team developed embraced: (*a*) the examination of function so far as possible by scientific methods; (*b*) the formulation of new methods of working; and (*c*) experimental design and experimental building. The extension of this kind of investigation to other fields is beyond the scope of the Trust, but not beyond that of the Foundation. The Foundation has therefore decided to establish a division for functional research in building design.

This short account of the activity of the Nuffield Foundation over a period of twelve months shows how wide are its ramifications. It is interesting that the Foundation should refer to research into hospital construction as research into "practical problems". We must assume that it has used this phrase for the edification of non-scientific persons. The Foundation is devoting a great deal of money, for example, to the investigation in Africa of the illness known as kwashiorkor and to its elimination. This is surely a problem of the most practical importance, and many other problems with which its research deals would undoubtedly be regarded as practical by everyone concerned. However, we must not find fault with the words used by such a widespread and generous enterprise. Australia has benefited greatly by Nuffield Fellowships, which have been awarded to many of its distinguished medical graduates, and no doubt, awards of this kind will still be made in the future.

Current Comment.

STREPTOMYCIN.

THE award of a Nobel Prize to Dr. Selman A. Waksman, discoverer of streptomycin, has deepened the interest of the thinking world in antibiotics in general and streptomycin in particular. Any agent which gives promise of help in combating tuberculosis, the "Great White Plague of Man", must be treated with earnestness and given every attention in the laboratory and at the bedside. Incidentally, it may be mentioned that antibiotics should have been discovered some considerable time ago. If jam or stale bread displays a pure culture of mould without antecedent seeding by human action, it should have been obvious that such a condition has arisen through the mould destroying or at least inhibiting competitors. This teleological consideration should be kept in mind when the selective action or "spectrum" of any antibiotic is discussed. It has been known for more than six decades that certain fungi and bacteria are capable of producing chemical substances which attack pathogenic organisms, but only within the last thirteen years have antibiotics found extensive application as chemotherapeutic agents. Amongst these penicillin and streptomycin have occupied a prominent place. Penicillin is largely active against Gram-positive bacteria, Gram-negative cocci, anaerobic bacteria, spirochetes and actinomycetes, whereas streptomycin is active against a variety of Gram-negative and acid-fast bacteria, as well as against Gram-positive organisms which have become resistant to penicillin. Neither of these antibiotics is active against rickettsiæ, viruses and fungi.

In the American magazine *Science*, Waksman gives a detailed and excellent account of the background, isolation, properties and utilization of streptomycin.[1] The most arresting discovery concerning streptomycin was its apparent action *in vivo* and *in vitro* of attacking the tubercle bacillus; in consequence streptomycin production changed from a laboratory activity to a large industry with a monthly output of more than 25,000 kilograms from the United States alone. A knowledge of the great abundance and wide distribution of actinomycetes and a recognition of their marked antagonism to other organisms led Waksman in 1939 to make a systematic investigation of their ability to produce antibiotics; this research culminated in the discovery and isolation of streptomycin, the most effective tuberculo-chemotherapeutic agent so far studied. There was nothing accidental or fortuitous in this successful climax; it was the outcome of laborious and sustained investigations frequently attended with failure, as when actinomycin, though a powerful antibiotic, was found to be extremely toxic to laboratory animals and so was abandoned. Some of the antibiotics isolated had a narrow spectrum—that is, were active against a very limited group of pathogenic organisms. It was found in the course of the inquiry that one organism could produce different strains of an antibiotic, also that different organ-

[1] *Science*, September 4, 1953.

isms could elaborate the same antibiotic, and further that the various strains of the organism attacked were not always equally sensitive.

Isolation of streptomycin was effected by a series of operations involving removal of the mycelium, adsorption of the antibiotic on charcoal or similar substrate, release from the adsorbing body by dilute acid, neutralization of this acid and finally evaporation and precipitation. The elucidation of the chemical nature of streptomycin was a triumph of modern organic chemistry; it is a glucoside of marked basic character, in which a diguanido group is linked with a nitrogen-containing disaccharide compound. The constitutional formula is complicated, conveying little information except to a trained organic chemist. The original unit was described as that amount of material which was sufficient to inhibit the growth of a standard of *Escherichia coli* in one mil of culture medium. When, however, streptomycin was prepared in crystalline form, it was found that one unit was comparable with one microgramme of the pure base.

Waksman gives the following list of diseases responding to streptomycin: (i) tularæmia; (ii) *Hæmophilus influenzæ* infections: meningitis, endocarditis, laryngo-tracheitis, urinary tract infections, pulmonary infections; (iii) meningitis due to *Escherichia coli, Proteus vulgaris, Klebsiella pneumoniæ, Bacillus lactis-aerogenes, Pseudomonas aeruginosa, Salmonella paratyphi*; (iv) bacteriæmia due to Gram-positive organisms: *Escherichia coli, Proteus vulgaris, Aerobacter aerogenes, Pseudomonas aeruginosa, Klebsiella pneumoniæ*; (v) urinary tract infections due to *Escherichia coli, Proteus vulgaris, Klebsiella pneumoniæ, Bacillus lactis-aerogenes, Hæmophilus influenzæ, Pseudomonas aeroginosa*. He states that streptomycin has been found to be a helpful agent, but the position is not yet definitely defined in the following diseases: peritonitis due to Gram-negative bacilli, pneumonia due to Friedländer's bacillus, liver abscesses due to Gram-negative bacilli, cholangitis due to Gram-negative bacilli, infections of heart valves with penicillin-resistant but streptomycin-sensitive organisms, tuberculosis, chronic pulmonary infections due to mixed Gram-negative flora, empyema due to Gram-negative organisms. An enumeration of the tuberculous infections suitable for streptomycin treatment is also given; this includes not only lesions of the respiratory region but extrapulmonary foci in bones, glands and alimentary tract. Treatment of tuberculous meningitis produced results not so promising, as remissions occurred after apparent cure. Other antibiotics produced by actinomycetes have been studied and a number new to science and therapeutics have been isolated, such as aureomycin, chloramphenicol, neomycin, terramycin, erythromycin and others. Waksman's article concludes on an optimistic note, which we all hope is justified: "The conquest of the Great White Plague, undreamt of less than ten years ago, is now virtually in sight."

THE INTRAGASTRIC ADMINISTRATION OF OXYGEN TO THE NEWBORN.

In 1950 Y. Åkerrén and N. Fürstenberg,[1] writing from Gothenburg, described their attempts to solve the problem of oxygenation in cases of severe asphyxia of the newborn by inflating the stomach with oxygen, the idea being that the oxygen should be absorbed through the gastric mucosa. Oxygen was introduced into the pharynx in a slow flow through a Nélaton catheter connected by a glass tube to the oxygen tank. A second catheter was introduced at the same time as a safety valve, in case pressure in the stomach should become too great. The passage of oxygen into the intestinal tract was verified by radiological examination. Åkerrén and Fürstenberg quoted a number of cases in which the procedure was used and stated that it seemed evident that gastro-intestinal oxygen administration was of value, and absorption of as much as 2·7 mils per minute might take place by this simple method, which could be carried out by untrained assistants. As they pointed out, it closely resembles the method of mouth-to-mouth insufflation, which also delivers oxygen into the stomach rather than to the lungs. Despite its dangers, the tracheal method has one obvious advantage over the intestinal method—namely, on spontaneous respiration there is oxygen in the trachea to be inhaled. For this reason Åkerrén and Fürstenberg consider that when the gastro-intestinal route is used a gas mask should be kept on hand so that the infant will then rebreathe the oxygen into the lungs.

Not much has been heard of this procedure since, but quite recently two groups of British workers have referred to it in the treatment of *asphyxia neonatorum*. H. K. Waller and David Morris[2] describe their experience with the intragastric administration of oxygen in a consecutive series of 48 infants at the British Hospital for Mothers and Babies at Woolwich. Of the 48 infants, seven failed to respond and 41 were resuscitated, but three of the 41 subsequently died. In those who responded, the usual sequence of events was a change in the infant's colour to pink, followed by the onset of breathing at a variable time. This time ranged from one to seventy-five minutes. Most of the infants were breathing within five minutes. At necropsy, severe cerebral damage was found in three babies, and in the remaining seven the only findings were atelectasis and evidence of asphyxia. From their fairly limited experience, Waller and Morris consider Åkerrén's method simple, safe and effective. Moreover, it is suitable for use with home confinements, and this fulfils the criteria which they lay down as necessary for a satisfactory method of combating *asphyxia neonatorum*. It is interesting to note that the method was first brought under notice at the hospital when Åkerrén himself visited the hospital in 1949. Just before leaving, he mentioned his method "modestly, indeed almost casually", to Waller, but no trial of the method was made for many months. Its novelty, apparently, made it not immediately acceptable, and no immediate opportunity arose for its use under careful conditions of observation. When, however, the opportunity arose, it was decided to extend the investigation of the method. The results were regarded as more than encouraging. Waller and Morris state that it may be objected that their claim for the method can be established only by a controlled study, but once it was found to be clinically effective it became impossible to withhold it from an infant who might benefit by it. They give details of the method and the lightweight apparatus used for the procedure, which they consider can be perfectly safely entrusted to nurses.

The other reference comes as part of an article on the treatment of *asphyxia neonatorum* by Josephine M. Lord, B. W. Powell and Hilda Roberts,[3] who have used it since June, 1952, as the routine treatment of apnœa in premature infants. They believe that it is a useful part of the treatment for these infants who are stated rarely to suffer from complete initial apnœa, but they have had no experience of it for full-time infants, for whom they prefer the continued use of endotracheal administration. They state that every premature infant so treated has become pink. They therefore rely on the intragastric administration of oxygen to give some oxygenation of the blood-stream and to enable the baby's respiratory centres to recover. During this time, postural drainage and pharyngeal suction are practised. If the baby cannot subsequently expand its lungs in spite of making respiratory efforts, it is treated by augmented respiration.

No doubt there will be many who feel that endotracheal insufflation is still the method of choice for the resuscitation of these infants, but the gastric approach appears to have certain advantages of convenience and simplicity, and so far no adverse comment has been made upon it. Its novelty should not preclude further investigation of its possibilities.

[1] *J. Obst. & Gynæc. Brit. Emp.*, October, 1950; quoted in "The 1951 Year Book of Obstetrics and Gynecology", page 243.

[1] *Lancet*, November 7, 1953.

[2] *Lancet*, November 14, 1953.

Abstracts from Medical Literature.

PÆDIATRICS.

Hyperpyrexia in the Post-Kernicterus Syndrome.

W. H. PATTERSON AND R. M. FORRESTER (*Arch. Dis. Child.*, June, 1953) state that infants surviving neurological disturbances in the initial illness of *icterus gravis neonatorum* are liable to suffer permanent derangement of the central nervous system. The characteristic picture of choreoathetosis, extrapyramidal rigidity, opisthotonus and mental defect is mentioned. They go on to describe further manifestations of the post-kernicterus syndrome in seven cases. The main features were hyperpyrexia, sweating and head retraction without evidence of infection; in the majority attacks were repeated many times, and in all but one death occurred in an attack. An eighth case occurred in an infant with acholuric jaundice, and in the ninth case the cause was obscure. The authors suggest that disturbance of the centre for heat production is responsible for the syndrome.

Idiopathic Myocarditis in Infants and Children.

H. WILLIAMS, R. N. O'REILLY AND A. WILLIAMS (*Arch. Dis. Child.*, August, 1953) present case histories of 14 children suffering from idiopathic myocarditis. Initial mild irritability, slight fever and anorexia were followed by dyspnœa, cyanosis, tachycardia and enlargement of the heart and liver. The authors state that difficulty in recognizing the presence of cardiac enlargement could make clinical differentiation from pneumonia almost impossible. In some cases the illness was insidious and heart failure not severe, but when recovery occurred after a long illness permanent cardiac damage was present. Pathologically the lesion was one of patchy muscle damage associated with inflammatory cell reaction. Treatment with digitalis and oxygen was of definite value in some patients. No clues to the ætiology of the condition were found.

Crossed Laterality.

R. A. H. PEARCE (*Arch. Dis. Child.*, August, 1953) states that all paired muscle systems are represented in the brain by paired controlling centres. Dominance, or leading control of function, may be entirely one-sided; but if some dominant centres are on the right and others on the left, the condition is called crossed laterality. In the school where this study was carried out it was found that 40% of the children encountered some educational difficulty at one time or another, and that of this group 70% had some type of crossed laterality. Reversal of units in a series was the basic symptom observed. Thus, for example, writing "b" for "d" is not uncommon in children just learning to read and write; but whereas normal children make the correction quickly and without difficulty, those with irregular dominance do not. Emotional upsets and educational retardation may ensue. Family histories presented by the author indicate a genetic origin for the condition. Treatment includes developing function on the most suitable side, as judged by the pattern of dominance, and the use of teaching techniques which allow multiple stimuli or which allow easier visual scanning. Treatment is effective.

The Pulmonary Vascular Bed and Congenital Heart Disease.

J. F. DAMMANN AND W. H. MULLER (*Pediatrics*, September, 1953) emphasize the importance of the pulmonary vascular bed in cases of single ventricle without pulmonary stenosis, large ventricular septal defect, Eisenmenger complex, *atrio-ventricularis communis*, true *truncus arteriosus*, aortic septal defect, large patent *ductus arteriosus*, and patent *ductus arteriosus* associated with coarctation of the aorta. They state that in each of these types of defect the pressures in the pulmonary circulation approximate those of the systemic circulation. As a result of this (*a*) the relatively thin-walled pulmonary vessels may be widened progressively so that more and more blood is directed to the pulmonary circuit and less and less to the systemic, and if this continues high output cardiac failure with pulmonary congestion occurs; or (*b*) a balance between pulmonary and systemic circulations may develop owing to retention of the relatively thick-walled type of pulmonary vessel which characterizes fœtal life; or (*c*) retention of the fœtal type of thick-walled pulmonary vessels may be associated with the development of pulmonary hypertension, hypertensive vascular changes and eventually diminished pulmonary blood-flow, leading to cyanosis and anoxia. The authors suggest that when a balance between pulmonary and systemic circulations is not attained, creation of an artificial pulmonary stenosis is beneficial. The procedure they use is to excise a segment of the wall of the pulmonary artery and place a band of polyethylene film and cotton tape around the artery. Case reports are given of three children in whom this operation was performed with benefit.

Effects of Withholding Fluid in the Immediate Post-Natal Period.

J. D. L. HANSEN AND C. A. SMITH (*Pediatrics*, August, 1953) state that it has been their practice to omit administration of food and fluid to premature infants, to infants born of diabetic mothers and to some others for forty-eight hours or more, because of the danger of inhalation of gastric contents. They have carried out tests to determine whether infants have a greater reserve of body fluids than is present in later life, and whether administration of glucose exerts the protein-sparing and sodium-sparing effects in the newborn period that Gamble has demonstrated in adults. Weight losses, outputs of sodium, potassium, chloride, nitrogen and water, and serum electrolyte estimations were investigated in nine infants receiving no intake for seventy-two hours after birth, and in nine controls receiving 50 mils of water per kilogram daily. In seven other infants, 2·5% to 10% of glucose was added to the water intake of the first three days. Electrolyte and nitrogen excretion was unaffected by water intake. Average weight loss was 13% in three days without water intake, as against 8% when water was given. Further conservation of body water was found to occur when glucose was given with water, but no protein-sparing or sodium-sparing effect was demonstrable. Prompt return of normal serum electrolyte concentrations when water and glucose were first given on the fourth day suggested good tolerance of three days without water intake.

Estimation of Blood Pressure in Childhood.

H. SAINSBURY (*Arch. Dis. Child.*, August, 1953) ascertained the reliability of blood pressure recordings made with standard sizes of inflatable cuffs in children of different ages. It was presumed that to obtain comparable readings the cuffs should enclose two-thirds of the upper arm. It was found that the ten-centimetre cuff could be used for children between the ages of four and twelve years. Below four years of age only the five-centimetre cuff was satisfactory, but over twelve years of age the adult twelve-centimetre cuff would fit. In those age ranges in which the cuffs departed materially from the requirements of enclosing two-thirds of the upper arm, comparison with readings taken with a folded cuff showed discrepancies which varied from nil to 20 millimetres of mercury but generally were small.

Interstitial "Plasma Cell" Pneumonia.

W. C. DEAMER AND H. V. ZOLLINGER (*Pediatrics*, July, 1953) draw attention to the relatively common occurrence of an interesting type of infantile pneumonia in Europe. They state that great predilection is shown for premature infants, and its occurrence is confined to the period between six weeks and four months of age. The onset is insidious; the infant begins to do poorly, and the respiratory rate gradually increases, with pronounced lateral abdominal movement developing. After one or two weeks, dyspnœa, sternal retraction, cyanosis and extremely rapid respirations become obvious. Fine crepitant râles and areas of hyporesonance may be observed, and interstitial emphysema or pneumothorax may develop. Fever, weight loss and cough may be absent or slight. Even at this stage, recovery may ensue after a further five to ten days of illness. At autopsy, the lungs appear grey, large and heavy. Interstitial emphysema is often present. Microscopic examination shows that the alveolar septa are much widened by cellular infiltration, which is almost entirely mononuclear in character. Plasma cells predominate, but there are also many cells resembling histiocytes. Amorphous alveolar exudate is present. A viral ætiology is suspected. Treatment is supportive.

ACTH in the Treatment of Erythroblastosis.

S. J. GEPPERT, J. H. AKEROYD AND J. W. SIMPSON (*Pediatrics*, July, 1953) summarize their recent experience with ACTH in the treatment of erythroblastosis. They state that 20 infants suffering from erythroblastosis were treated with ACTH, 12·5 milligrammes being given immediately after delivery and 6·25 milligrammes every six hours for a median period of 8·5 days. There

was a quicker reversal of the Coombs test result than would have been expected naturally, and nucleated cell counts decreased to normal levels by the fourth day. Red cell counts and hæmoglobin determinations showed a tendency to rise during the period of treatment with ACTH. Jaundice developed in most cases. Transfusions were given to ten of the infants after cessation of ACTH therapy. Three patients died, one with kernicterus. None of the survivors showed signs of kernicterus. The authors suggest that a more desirable method of treatment might be to give an exchange transfusion to those infants who show alarming rise in serum bilirubin content or persistently positive Coombs test results, despite ACTH administration.

ORTHOPÆDIC SURGERY.

Bank Bone for Spine Fusion in Tuberculosis.

D. M. BOSWORTH, H. A. WRIGHT, W. FIELDING AND E. R. GOODRICH (*J. Bone & Joint Surg.*, April, 1953) have reviewed 21 cases of tuberculosis in which operation was performed in an attempt to secure arthrodesis of the spine. A total of 71 fusion procedures were performed on the 21 patients, 26 with bank bone and 45 with fresh autogenous bone. Calculations of pseudarthrosis percentages were based on the total number of interspaces covered for the first time and the number of pseudarthrosis interspaces which developed. There were 239 fresh spaces covered; of these, 104 were with bank bone and 135 with autogenous bone. There was failure of 32·7% with bank bone and 13·3% with autogenous bone. The authors noted that in the cases in which fusion did occur with either method, fusion in those with bank bone was less in thickness than the fusion in those with fresh autogenous bone. Where pseudarthrosis did occur, those with bank bone tended to show pronounced absorption of graft, while those with fresh autogenous bone usually showed merely a break in continuity. The authors conclude that the pseudarthrosis rate as calculated by vertebral interspaces covered was almost three times as high with bank bone as with fresh autogenous bone. In the repair of pseudarthrosis the failure rate of bank bone was three times that of fresh autogenous bone. The fact that bank bone implantation gave no higher rate of pseudarthrosis was believed to be due to the accompanying meticulous Hibbs type of fusion. Bilateral spine fusion as compared with hemifusion gave no statistical advantage.

Hyaluronidase in Orthopædic Surgery.

W. R. MACAUSLAND, J. J. GARTLAND AND H. HALLOCK (*J. Bone & Joint Surg.*, July, 1953) state that hyaluronidase is a definite aid in treatment in orthopædic cases in which hæmorrhage and œdema have been present. Hyaluronidase, itself, has no propulsive ability, but the addition of mechanical pressure exerted on the fluid collections enhances the action of hyaluronidase by providing a motivating force which will act upon the fluid. Clinically this is supplied externally by an elastic bandage, or internally by increasing the fluid pressure locally at the time of hyaluronidase injection by the addition of fluid. The authors found that treatment with hyaluronidase in procaine followed by application of an elastic bandage allowed immediate weight-bearing. The swelling and hæmatoma were reduced after one or two hours, when an elastic bandage would be reapplied. Other joint sprains have been treated with the same beneficial results, particularly those of the interphalangeal joints of the fingers. The authors also found that they were able to increase the efficacy of procaine and produce more satisfactory local anæsthesia by the use of hyaluronidase. They state that in the early stages of Volkmann's contracture hyaluronidase and procaine offer an effective non-operative method to relieve subfascial tension caused by œdema and hæmorrhage. Injections were given into certain types of soft tissue injuries which had resulted in considerable hæmorrhage and swelling, with great relief of tension and pain and the dispersion of the hæmatoma. The effect was found to be constant and continued even after the anæsthesia produced by the procaine had worn off. In surgery involving the opening of the knee joint for meniscectomy and other intraarticular procedures, the authors have instilled hyaluronidase into the joint when closing it. The apparent reduction of post-operative joint distension was considerable. With acute hæmarthrosis in hæmophiliacs there has resulted rapid restoration of a normal range of movement, and perhaps even more important is the early restoration of normal synovial fluid to the involved joint; thus the normal nutritional source of the articular cartilage has returned, with forestalling or prevention of the degenerative changes which lead to crippling arthritis.

Surgical Treatment of Epicondylitis.

G. E. SPENCER AND C. H. HERNDON (*J. Bone & Joint Surg.*, April, 1953) believe that the theory of periosteal tear or fracture with accompanying periostitis or myofascitis is probably the most acceptable explanation for the symptom complex of epicondylitis. They state that in most cases symptoms associated with epicondylitis will disappear after conservative treatment—for example, heat, splints, local injections of procaine, deep X-ray treatment, rest and exercise. Between June, 1941, and June, 1951, symptoms persisted in spite of conservative measures in 49 cases of epicondylitis in 44 patients. These patients were operated upon for relief of symptoms including persistent pain. The average age of the patients was forty-three years, and the average duration of symptoms from onset until operation was six months. Of the 49 operative procedures 25 consisted in a fasciotomy. Through a linear incision, one and a half inches long, a simple transverse division was made of the deep fascial covering of the common extensor group of muscles, one centimetre distal to the lateral epicondyle. The intermuscular septum was also divided. Only the skin and subcutaneous tissue were closed. In those instances in which the medial epicondyle was involved, a similar procedure was carried out one centimetre distal to the medial epicondyle. In the remaining 26 cases, the fascial and tendinous attachments to the epicondyle were released by the stripping of these attachments from the epicondyle with a sharp elevator. The muscles were permitted to retract, and only the skin and subcutaneous tissue were closed. After the operation, the arm was placed in a sling for the patient's comfort, but the patient was encouraged to use the hand and arm as soon as he could do so comfortably. These patients remained in the hospital an average of only two days after operation. Convalescence was, as a rule, quite rapid. The average number of days before the patient returned to his regular occupation was 13·5. The shortest period was three days and the longest seventy-two days. The average number of days before the patients were completely asymptomatic was 27·1, the longest period being seventy-two days and the shortest seven days. The end results of the 49 procedures were excellent in 67·3% of cases, good in 28·6% and poor in 4·1%. There was one recurrence following subperiosteal stripping, which was relieved later by fasciotomy. When the results were divided according to the type of surgical procedure performed, it was found that the results following fasciotomy were excellent in 78·7% of cases, good in 17·3% and poor in 4·0%. The results following subperiosteal stripping were excellent in 57·6% of cases, good in 38·4% and poor in 4%.

Elmslie's Operation for the Calcaneus Foot.

J. A. CHOLMELEY (*J. Bone & Joint Surg.*, February, 1953) states that Elmslie's method of midtarsal-subtalar arthrodesis and tendon transplantation for paralytic *talipes calcaneo-cavus* is not well known, and he believes that the operation is of sufficient value to justify a description. This operation is performed in two stages. At the first stage Steindler's stripping of the under surface of the *os calcis* is carried out to flatten the arch, and an arthrodesis of the astragalo-scaphoid joint is performed at the same time. The foot is then fixed in plaster of Paris in strong dorsiflexion for a period of six weeks. At the second operation a vertical incision four or five inches long is made along the inner border of the *tendo Achillis*. The tendons of *flexor longus hallucis, flexor longus digitorum, peroneus longus* and *peroneus brevis* are isolated and divided as low down as possible. Posterior subastragaloid arthrodesis is then carried out. A strip of the *tendo Achillis* is fixed to the back of the tibia holding the foot in about 20° of plantar flexion, and the four tendons mentioned are transplanted into the *tendo Achillis* just above its insertion. The foot is fixed in plaster of Paris in 20° of plantar flexion, and the plaster is kept on for a total period of three months. The author states that Elmslie's operation has also the advantage that it can be modified to suit individual conditions and needs. Thus both the talo-navicular and calcaneo-cuboid joints can be arthrodesed without materially altering the operation. Similarly in the second stage it may not be necessary or desirable in some cases to transplant all the posterior tibial and peroneal muscles or to use a strip of the *tendo calcaneus* to form a tenodesis. Illustrative cases are described.

British Medical Association News.

SCIENTIFIC.

A MEETING of the South Australian Branch of the British Medical Association was held on May 28, 1953, at the Verco Theatre, Institute of Medical and Veterinary Science, DR. B. S. HANSON, the President, in the chair.

Tetanus.

DR. F. BEARE read a paper entitled "Some Observations on Tetanus" (see page 949).

DR. C. ALDERMAN said that in speaking of tetanus he must confine himself to experiences of the infection in children and the methods of treatment at the Adelaide Children's Hospital, for he had no knowledge of the subject outside those limits. Their figures had followed those quoted by Dr. Beare, in that there had been an increase in the number of patients treated per year in the last ten years. He was afraid that their mortality figures did not show up in a good light when compared with those of Dr. Beare, for they had had a mortality rate of 39% in the same period. There had been no significant factors in the incidence of the disease according to age groups, subjects of all ages from two to twelve years being equally affected. Only two cases of neonatal tetanus had been recorded since 1880, and they had just successfully concluded the treatment of their youngest patient, a girl, aged five months.

Dr. Alderman went on to say that before commenting on treatment he wished to say that he considered that the only two institutions capable of treating tetanus in South Australia were the Royal Adelaide Hospital and the Adelaide Children's Hospital. To treat that infection successfully, particularly with modern methods, required a large nursing staff in constant attendance. That was beyond the capabilities of most hospitals in the State, and also required a medical officer, if not in constant attendance, certainly within a few minutes' call, which was possible only in those two institutions with their resident medical staff. Dr. Alderman felt very strongly that no matter how ill the patient might be, it was worth the risk of transporting him from any part of the State to Adelaide. Should the journey prove fatal, then he thought that the patient would have died in any case, and nothing had been lost. Should he arrive alive, even if almost moribund, he at least had some chance of recovering, as had happened at the Adelaide Children's Hospital on two or three occasions.

With regard to treatment, Dr. Alderman said that he agreed strongly with Dr. Beare that no matter what treatment was used, there must be a definite plan of action mapped out beforehand; it must not be left to haphazard spur-of-the-moment actions which might well prove useless. They had slowly been made to realize, mainly by the anæsthetists, the important part played by unrecognized subclinical anoxia in the course of an illness in which there was respiratory distress. The regime which they now employed was based on the overcoming of that factor, and, even more importantly they thought, on the prevention of secondary respiratory conditions such as pneumonia and segmental collapse. In the past few years they had lost more tetanus patients from respiratory complications than from the disease itself. To that end the following routine procedure in recent cases had been adopted as soon as a diagnosis was made:

1. They gave 200,000 units of antitoxin, usually subcutaneously, with the addition of hyaluronidase, and commenced heavy penicillin dosage in the region of 500,000 units every six hours.

2. An immediate routine tracheotomy was performed, the main object being to allow efficient removal of the bronchial secretions and prevent secondary lung complications, and also to allow as efficient oxygenation of the lungs as possible. For that reason also the child was usually nursed in an oxygen tent.

3. They relied almost solely on one of the muscle relaxants to minimize the spasms and so prevent exhaustion. In the past they had used "Myanesin" both orally and intravenously. In the latter case they used the continuous drip method, employing 1% to 2% solution in water and dextrose, and giving in some cases up to 32 grammes in twenty-four hours to a six or seven year old child.

Dr. Alderman went on to say that "Myanesin" was probably not so effective as the new relaxants, for it had a definite depressant effect on the vital centres, particularly the respiratory centre, but not nearly to the same degree as the phenobarbitals, with a far greater relaxing effect on the musculature. They relied almost completely on "Myanesin", and in one of their last two cases "Flaxedil" for muscle relaxation and in the case of "Myanesin" for sedation as well. On occasions when the effect of the relaxing agent had not been sufficient, further sedation had been confined to paraldehyde, given either orally or intramuscularly, or on rare occasions potassium bromide and chloral hydrate. The phenobarbitals had been almost totally excluded, for it was thought that they not only dangerously depressed the respiratory centre, particularly in children, but also further hindered the transport of oxygen across the cell wall—a process already hampered by the toxæmia.

In conclusion, Dr. Alderman said that he felt certain that with the introduction of the newer relaxants which acted on the myo-neural junction, and the mastering of the technique of their use when applied to tetanus, in conjunction with a routine tracheotomy and scrupulous attention to the removal of the pulmonary secretions, they would have taken a big step forward in the treatment of tetanus.

DR. MALCOLM COCKBURN said that in a serious illness such as tetanus, in which it had been shown that the mortality rate was between 30% and 40%, the motto should be: "Prevention is better than cure." In that regard tetanus was almost unknown in the second World War in members of the forces who had received prophylactic injections of tetanus toxoid; he had yet to see a case of tetanus in a child who had received prophylactic management. Dr. Cockburn urged that parents be advised more frequently by medical practitioners of the advantages to their children (and to themselves) of tetanus toxoid given prophylactically. The employment of universal prophylaxis was an ideal, but not easy of attainment. When he was in America a few years previously, he had seen triple prophylactic injections, in which pertussis vaccine and diphtheria and tetanus toxoids were combined for use in immunizing programmes in infants. He had heard no opinion of their efficacy.

SIR PHILIP MESSENT said that Dr. Beare's paper had been of special interest to him, because many years earlier the staff of the Royal Adelaide Hospital had decided to transfer all patients suffering from tetanus to the care of a physician and surgeon, so that they might gain special experience in the treatment of that condition. Until that night, so far as he knew, no report on the work had been made, and Dr. Beare's excellent summary was welcome. Apparently what had to be stressed was that the mortality rate of established tetanus was still deplorably high, and that the results of prophylaxis with toxoid were so good that that method of prevention should be more widely adopted.

Dr. Beare, in reply, said that Dr. Alderman's remarks about the mortality rate of 39% among patients aged under twelve years at the Adelaide Children's Hospital were complementary to the 38% mortality rate among patients aged sixty years or over in his series. That confirmed the observations previously made that tetanus was more often fatal at the extremes of age. Dr. Beare agreed that for success in treatment to be achieved, skilled nursing and every hospital facility were necessary—tetanus was not a disease that lent itself to domiciliary treatment. He was in complete agreement with Dr. Alderman with regard to the dangers of anoxia and respiratory distress and infection. For that reason he was advising tracheotomy more frequently, and he was sure that it was a life-saving procedure in many cases, and in any case made the patient more comfortable and much less distressed and alarmed. He had been most interested to learn of Dr. Alderman's experiences with the use of "Myanesin" given by the "drip" method and the employment of newer muscle relaxants such as "Flaxedil". He intended to try those measures at the Royal Adelaide Hospital.

In reply to Dr. Peter Bateman, Dr. Beare said that he thought that dog bites were a potential source of infection, in view of the feeding habits of dogs. He did not agree that penicillin was of much use in the prophylaxis of the disease, but pinned his faith to tetanus antiserum suitably administered. In reply to Dr. Cockburn, Dr. Beare said that all was not yet known about the duration of immunity conferred by toxoid suitably administered, but he thought that a period of five years was the usually accepted duration of such protection. In that respect he had always advocated active immunization with toxoid, and the technique employed in the forces could be used unless a better method was evolved. To Dr. Sholto Douglas's question, Dr. Beare replied that the titre of antibody could be estimated in the patients' serum, so the degree of immunity could be thus determined, but certainly "booster" doses of toxoid

should be given after certain arbitrary intervals. The remarks of Dr. Melville Chinner and Dr. Hewgill Hamilton on the subject of multiple immunizing agents had been most interesting; but he had had little experience of such materials. Combined toxoids of tetanus and diphtheria were on the market, and it would seem that they did act together successfully. He know that diphtheria toxoid and pertussis vaccine could be given at the same time, and in his experience over many years, with no untoward effect. The Commonwealth Serum Laboratories advised that tetanus toxoid and tetanus antiserum could be given at the same time, but should not be mixed outside the body before injection. It seemed that all toxoids or vaccines or antisera were not suitable to be used with each other at the same time; in fact, some combinations seem to lessen each component's beneficial effect.

In reply to Dr. Rupert Magarey, Dr. Beare said that service personnel suitably immunized with toxoid during the second World War should receive "booster" doses to keep up their immunity. He had been interested to hear from Professor Robson that tetanus was a seasonal disease in Scotland. No doubt the severe Scottish winters restricted the outdoor activities of the Scots, so lessening the possibilities of acquiring tetanus. As far as South Australia was concerned, he knew of no such seasonal incidence, but had no figures available to back up that impression. In fact, there seemed to be a case of tetanus "about the place" at most times of the year.

In reply to one comment, Dr. Beare said he thought that an accident patient with such an injury as a compound fracture acquired under "dirty" conditions was always under suspicion of tetanus. Should further surgical treatment be needed at any future date in such a case, large doses of tetanus antiserum should be administered before operation. It was possible that latent tetanus could be stirred into activity by surgical measures. Finally Dr. Beare said that he agreed with Sir Philip Messent, who had advocated team work in the treatment of tetanus, and thought that only good could come from a committee set up to report on the activities of such a team.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

LEG IRONS AT EMU PLAINS.[1]

Medical Department,
Sydney,
April 6, 1833.

The Honorable Colonial Secretary.

Sir,

I have the honor to transmit a list of nine men in the Windsor Hospital belonging to the Ironed Gang at Emu Plains who have slight sores which render them incapable of wearing Irons on both legs. I therefore request His Excellency the Governor will be pleased to authorize the Superintendent of the Stockyard to place both Irons on one leg which will enable them to perform the work required and by this means their sentences will not be evaded as has frequently been the case in similar instances.

Yours, etc.,
J. BOWMAN,
Inspector of Colonial Hospitals.

Correspondence.

THE MODERN TREATMENT OF BENIGN PROSTATIC OBSTRUCTION.

SIR: The best method of dealing with bladder-neck obstruction has been a matter of debate and argument over the past fifty years. The general consensus of leading urological opinion is that from a general rather than an individual point of view there is no best method. It is felt that two main factors must come into any choice of operation. These are: (i) the type of patient as regards age and risk assessment; (ii) the ability of the surgeon to perform any particular type of operation.

The training required for the adequate performance of endoscopic resection is prolonged and difficult to acquire. This training and the performance of the operation itself require a considerable amount of patience and access to expensive equipment of a high standard. The resectionist must, therefore, be temperamentally as well as surgically fitted for this procedure to get satisfactory results.

The surgeon trained only in open surgery will naturally prefer this method and maybe express a dislike for endoscopic surgery. One, therefore, must criticize the remarks of Mr. Ian Hamilton as published in your journal (November 21, 1953) when he takes a definite attitude condemning transurethral resection as a method of relief for bladder-neck obstruction except for fibrous bars and malignancies which do not respond sufficiently to œstrogenic therapy. He is perfectly entitled to state his preference for open surgery if his results are better with that method or if he has had no adequate training or experience in endoscopic surgery, but to condemn resection by stating in a general way that incontinence of urine post-operatively is a common complication and incomplete removal of the prostate practically always occurs is completely unjustifiable. It is not denied that these complications may occur, but that is not necessarily a criticism of the operation; it is more obviously a criticism of the ability or otherwise of the particular surgeon to carry it out.

It has been my experience over the past twenty years that the operation of endoscopic resection has been of the greatest value; until now over 90% of men presenting in my practice with symptoms of bladder-neck obstruction are dealt with in this manner. To some thousands of patients of all ages and risks it has presented a curative operation with a minimum of post-operative discomfort, morbidity and mortality. No case of permanent incontinence has occurred during the past six years, and the functional results have been perfectly satisfactory.

Yours, etc.,

254 Albert Street,
East Melbourne,
December 8, 1953.

HENRY MORTENSEN.

RECENT EXPERIENCES IN THORACIC SURGERY IN NEW SOUTH WALES.

SIR: It was most interesting to read in the journal of October 17 Mr. Ian Monk's forthright expression of thoracic surgical problems in New South Wales. Over the same period I have experienced similar and in some cases complementary problems. Like Mr. C. J. Officer-Brown and Mr. K. N. Morris, of the Alfred Hospital, Melbourne, my work in the thoracic unit at Saint Vincent's is confined to non-tuberculous conditions. There are twelve beds; there is one surgeon. In the past year 111 thoracotomies were carried out. These were distributed as follows: lung, mediastinum, diaphragm—75; cardio-vascular (valvotomy, ductus, coarctation)—25; œsophagus (resection, hellers)—11.

It will be appreciated that the subjects of such operations fall into the category of interesting cases. This is reflected in the enthusiasm of all who deal with them. In particular I refer to ward sister, theatre sister, theatre attendants and resident medical staff. It is an enthusiasm which engenders the confidence necessary for ideal conditions, and there is no place for thoracic surgery unless conditions are ideal.

On the other hand in a unit devoted entirely to tuberculosis (and I distinguish between unit and sanatorium) interest is not sustained. The clinical picture is rarely exciting, the nursing is heavy, and surgery seldom brings spectacular change. It is not surprising that few nurses and very few young graduates become enthusiastic. The surgeon is hampered if not obstructed by the roaming theatre sister, who, initially having started to see what it was like and finding the cases mostly long, arduous and to a pattern, soon (quite sensibly) retires to gentler fields. Yet the surgery of tuberculosis, which is certainly the most tedious and often the most difficult of all chest surgery, demands perfect conditions.

It is axiomatic that, as one mounts the scale of excellence in any skill, the number of practitioners diminishes: the

[1] From the original in the Mitchell Library, Sydney.

higher the fewer. In New South Wales there are very few thoracic surgeons. It is preposterous to expect a man who has reached the standard of training required to fit him for a thoracic surgical career to be restricted by an artificial barrier to the surgery of pulmonary tuberculosis, especially when his position on the scale of excellence is rewarded to the extent of £3 18s. 9d. for a three-hour session. It is only reasonable for him to seek relief from the tedium of tuberculosis surgery in the spate of interest provided by non-tuberculous problems.

In order to carry out 111 thoracotomies in a year a great deal of work is necessary. Each week it demands two operating sessions, one half-day in the chest clinic (there to see in conjunction with Dr. A. G. McManis between 50 and 60 patients), an endoscopy session, a teaching session, and daily rounds and attendance at consultative clinics such as the cardio-vascular unit. In all, a total of nearly three full days of honorary work each week. By the time similar honorary work is done on a smaller scale at two other institutions, one feels rather less of an honorary and rather more of a philanthropist.

This leaves little time for the private case. Private work there is, but the occasional case in a private hospital under the care of a "special" requires inordinate time and constant vigilance of the "special". The facilities of a thoracic unit are imperative.

Three factors—(a) the arduous nature of the specialty, (b) the poor remuneration for tuberculosis surgery and (c) the great bulk of honorary work—have been responsible for the development of the general surgeon with an intra-thoracic hobby. Whilst this might be additional interest for the surgeon, it is hardly conducive to the proper development of a large surgical specialty.

There is a tremendous amount of work to be done. There are well-trained men keen to do it, but they must have security. In short, they must have working conditions with an incentive, they must be adequately paid for their services to tuberculosis, and their private patients, like their more fortunate public patients, must be accorded the privilege of treatment in a thoracic unit.

Yours, etc.,

HARRY M. WINDSOR.

189 Macquarie Street,
Sydney,
November 31, 1953.

ESTABLISHMENT OF INTERNATIONAL HOUSE, MELBOURNE.

SIR: With the purchase of a site in Sydney Road, Parkville, within seven minutes' walk of the University, plans are taking shape for building Australia's first International House in Melbourne. Leighton Irwin and Company, with Raymond Berg and H. L. Waugh as consultants, have been appointed architects, and it is expected that plans will be submitted for approval of the University Council at its December meeting.

The first section to be built will consist of a block of 40 bedroom studies, with a services block and dining-room to accommodate a greater number, so that overseas students living in approved boarding houses can have their dinner at International House and enjoy its other amenities. The building of this section will cost £90,000 to £100,000, in addition to the cost of the land, which was £23,500. Towards this total amount, £35,000 has been raised locally, and news has just been received that the Legislative Council of Singapore has contributed £A14,500 to a local fund opened in support of the Victorian Appeal.

Dr. Ian Clunies-Ross is President of the International House Committee, and Mr. Gregg Wilson is chairman of the Appeal Committee, which still requires approximately £70,000 to carry out its objective of building the first wing during 1954, so that students can go into residence for the 1955 academic year. Donations, which may be sent to the Chairman, International House Appeal, University of Melbourne, Carlton, N.3, are deductible for purposes of income tax.

Yours, etc.,

CONSTANCE DUNCAN,
Organizing Secretary, International House Appeal.

University of Melbourne,
Carlton,
Victoria.
December 7, 1953.

Naval, Military and Air Force.

APPOINTMENTS.

THE following appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 73, of November 19, 1953.

AUSTRALIAN MILITARY FORCES.

Australian Regular Army.

Royal Australian Army Medical Corps (Medical).

To be Captain, 9th January, 1952, with a Short Service Commission for a Period of One Year.—2/40161 Robert Steve Edgley (in lieu of the notification respecting NX700345 Robert Steve Edgley which appeared in Executive Minute No. 38 of 1952, promulgated in *Commonwealth Gazette*, No. 22, of 1952).

The short service commission granted to 2/40161 Captain R. S. Edgley is extended to 29th May, 1953.

2/40161 Captain R. S. Edgley is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (2nd Military District), 30th May, 1953.

Citizen Military Forces.

Eastern Command: Second Military District.

Royal Australian Army Medical Corps (Medical).—The following officers are appointed from the Reserve of Officers: 2/134180 Captain T. W. Edmeades, 7th September, 1953, and 2/127045 Honorary Captain H. M. Learoyd, and to be Captain (provisionally), 8th September, 1953. To be Captain (provisionally), 12th October, 1953: 2/130110 Fredrick McGill Grace.

Southern Command: Third Military District.

Royal Australian Army Medical Corps (Medical).—3/50196 Major C. D. Donald is appointed from the Reserve of Officers, 1st July, 1953.

Central Command: Fourth Military District.

Royal Australian Army Medical Corps (Medical).—To be Temporary Major, 7th October, 1953: 4/31922 Captain G. C. Thornton.

Western Command: Fifth Military District.

Royal Australian Army Medical Corps (Medical).—The resignation of 5/26513 Captain (provisionally) B. R. Buttsworth of his commission is accepted, 31st December, 1952.

Tasmania Command: Sixth Military District.

Royal Australian Army Medical Corps (Medical).—To be Captain (provisionally), 12th October, 1953: 6/15383 Joseph Frederick Correy.

ROYAL AUSTRALIAN AIR FORCE.

Permanent Air Force.

Medical Branch.

The probationary appointment of the following Flight Lieutenants is confirmed: G. S. Radford (025626), D. B. G. Bailie (039232).

The probationary appointment of the following officers is confirmed: Flight Lieutenant W. Buckingham (025670), Flying Officer A. E. Greentree (022681).

AIR FORCE RESERVE.

Medical Branch.

The following former officers are appointed to commissions with rank as indicated: (Group Captain) C. J. N. Leleu, O.B.E. (03178), 2nd September, 1953; (Flight Lieutenant) M. R. Madigan (437220), 21st August, 1953.

University Intelligence.

UNIVERSITY OF MELBOURNE.

Chairs of Medicine and Surgery.

THE following letter has been received from Sir John Newman-Morris, chairman of the executive committee of the Medical Fund Appeal for Chairs of Medicine and Surgery in the University of Melbourne.

Ever since the medical school of the University of Melbourne opened its doors in 1864 there has been an increasing number of professors and departments of the pre-clinical subjects of the medical curriculum; there has not yet been a professor or true department of clinical medicine or surgery. Instead the clinical aspects of these subjects have been taught by doctors and surgeons who have given of their own time, by the honoraries in the teaching hospitals as you know.

In recent years it has become more and more apparent that the coordination of teaching in these subjects requires the full-time services of a fully qualified man. In order to conform to accepted standards elsewhere in the world, it is also clear that he should be of professorial status.

The reasons for this development need no explanation. The Council of the University of Melbourne is now about to appoint the first of these professors, a professor of medicine. As soon as funds permit a chair and department of surgery will be added and so on. From the viewpoint of teaching and coordination, obviously the more nearly together these first professors are selected and appointed the better.

These proposals have the unqualified support of the Victorian Branch of the British Medical Association and the Association supports the appeal for funds. All graduates of the Melbourne School anywhere and all members of the medical profession practising or resident in Victoria are being written to personally seeking their support. If you are one of them, or even if you are not, will you add yours?

(Sgd.) J. NEWMAN-MORRIS,
Chairman.

Royal Australasian College of Surgeons.

FINAL FELLOWSHIP EXAMINATION.

THE next meeting of the Court of Examiners for the final examination for Fellowship of the Royal Australasian College of Surgeons will be held at the College in Melbourne beginning on Thursday, May 6, 1954.

Candidates who desire to present themselves at this examination should apply, on the prescribed form, to the Censor-in-Chief for permission to do so on or before March 25, 1954. The appropriate forms are available from the Secretary, Royal Australasian College of Surgeons, Spring Street, Melbourne.

Candidates who have already been approved by the Censor-in-Chief, but who have not yet presented for examination, may present at this examination, provided they notify the Secretary of their intention to do so by March 25, 1954.

The examination fee is £21, *plus* exchange on cheques drawn on banks outside Melbourne, and must be paid to the Secretary by March 25, 1954.

The Council has decided that, as an emergency measure, one more final examination shall be held in the special branches of gynæcology and operative obstetrics, orthopædics, urology and laryngo-otology. This examination will be conducted in May, 1954. This is the last occasion on which candidates may present for the final examination for Fellowship in these special branches of surgery. After the May, 1954, examination, the final examination will be conducted in general surgery and ophthalmology only. The final examination in general surgery will be held twice in each calendar year, and at least one final examination in ophthalmology will also be held in each year.

Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Annual General Revision Course, 1954.

THE Post-Graduate Committee in Medicine in the University of Sydney announces that as April 26, 1954, is a public holiday, the annual general revision course will begin on April 27 and conclude on May 7, 1954. The main theme of the course will be gastro-enterology, and in addition, the programme will, as in former years, include a survey of medicine, surgery, obstetrics, gynæcology, pædiatrics and

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED NOVEMBER 21, 1953.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	4(1)	2(2)	..	..	..	..	1	..	7
Amœbiasis	..	1(1)	..	..	..	..	..	..	1
Ancylostomiasis	..	..	..	..	..	..	1	..	1
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Brucellosis	1(1)	..	..	..	..	..	..	..	1
Cholera	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus)	..	..	..	..	..	..	..	..	..
Dengue	..	..	..	..	..	..	..	..	..
Diarrhœa (Infantile)	..	4(4)	7(5)	..	..	..	..	..	11
Diphtheria	4(3)	2(2)	3(2)	1	1	1(1)	..	..	12
Dysentery (Bacillary)	..	..	..	..	1(1)	..	..	..	1
Encephalitis	..	..	..	..	..	..	..	..	..
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid	..	..	..	..	..	..	..	..	..
Infective Hepatitis	..	6(1)	..	..	5(3)	..	..	..	11
Lead Poisoning	..	..	1	..	..	..	..	..	1
Leprosy	..	..	1	..	..	..	2	..	3
Leptospirosis	..	..	1	..	..	..	..	..	1
Malaria	..	..	1	..	..	1(1)	..	..	2
Meningococcal Infection	2	2(1)	2(1)	..	..	..	1	..	7
Ophthalmia	..	..	..	..	..	..	..	..	..
Ornithosis	1(1)	..	..	..	..	..	..	..	1
Paratyphoid	..	..	..	..	..	..	..	..	..
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	6(3)	5(4)	..	5(5)	..	..	..	..	16
Puerperal Fever	..	..	..	..	..	..	..	..	..
Rubella	..	14(11)	..	..	49(39)	..	..	..	63
Salmonella Infection	..	..	..	..	..	..	..	..	..
Scarlet Fever	17(12)	25(22)	34(30)	2(2)	1(1)	1	..	..	80
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	..	1	..	..	..	..	..	1
Trachoma	..	..	..	..	..	..	..	..	..
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	48(31)	20(17)	12(7)	8(7)	4(2)	3(1)	1	..	96
Typhoid Fever	1(1)	2(2)	..	..	..	1	..	..	4
Typhus (Flea-, Mite- and *Tick-borne*)	..	..	2	..	..	..	..	..	2
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] Figures in parentheses are those for the metropolitan area.

specialties, with emphasis on modern trends in diagnosis and treatment of special value to general practitioners. Special demonstrations will be conducted in neurology, psychiatry, pædiatrics and fractures; and seminars will be held in gynæcology, obstetrics, new drugs and therapeutic measures, and general medicine and surgery. Special radiographic and electrocardiographic conferences will be included in the programme and members of the courses are invited to present their own X-ray films and electrocardiograms for discussion.

Special social functions will be arranged during the two weeks of the general revision course. These will include a cocktail and theatre party, and the annual post-graduate oration on "The Life and Times of William Bland", to be given by Dr. A. M. McIntosh. Play for the post-graduate golf cup will be in two divisions, Division A (open) and Division B (country competitors only), and will be held on Friday, April 30, 1954.

Fee for attendance will be £12 12s. full time and £6 6s. for one week or part time. Fees and travelling expenses may be claimed as taxation deductions.

Inquiries should be made to the Honorary Director, Post-Graduate Committee in Medicine, 131 Macquarie Street, Sydney. Telephones: BU 5238 and BW 7483.

FEDERATION OF COUNTRY LOCAL ASSOCIATIONS.

Post-Graduate Course, 1954.

THE third annual post-graduate course arranged by the Federation of Country Local Associations of the New South Wales Branch of the British Medical Association will be held in Canberra from April 20 to 24, 1954, both inclusive. Fee for attendance will be £8 8s., and early enrolment is requested. Intending members are invited to write to the Course Secretary, Dr. A. G. Cumpston, 70 David Street, Turner, Canberra, A.C.T.

Corrigendum.

OWING to an oversight the legends were omitted from the figures in the article entitled "The Use of Thermostatically Controlled Electric Heating Pads in a Maternity Nursery", by Clair Isbister and James Isbister, published in the issue of December 12, 1953. We regret this oversight and offer our apologies to the authors. The omitted legends are as follows:

Figure I: Outer graph, cot temperature; inner graph, room temperature. Clockwise rotation once in twenty-four hours. Baby in cot warmed by hot-water bags in air-conditioned premature ward. Variation of 14° C. with maximum variation occurring after night staff had changed the hot-water bags prior to going off duty. Day variation, 8° C.

Figure II: Outer graph, cot temperature; inner graph, room temperature. Clockwise rotation once in twenty-four hours. Baby in cot warmed by hot-water bags in premature ward. Special effort was made to maintain stable temperatures by close supervision by sister. Variation, 5° C.

Figure III: Outer graph, cot temperature; inner graph, room temperature. Clockwise rotation once in twenty-four hours. Cot warmed by heating pad A with thermostat, premature baby in cot. Cot temperature variation, 2° C.

Figure IV: Outer graph, cot temperature; inner graph, room temperature. Clockwise rotation once in twenty-four hours. Cot warmed by heating pad B in general nursery. Shocked baby with body temperature of 95° F. placed in cot. Baby's body temperature rose to 98° F. in one hour and remained stable. Cot temperature variation was 3° C.

Figure V: Cot with usual cot bedding warmed by heating pad B operating on 10 volts with no thermostat. Maximum temperature, 39° C. (100° F.).

Medical Prizes.

PRIZE FOR MEDICO-SURGICAL FILM.

THE annual prize offered by *La presse médicale* for a medico-surgical film, amounting to 100,000 francs with various other awards will be presented during the last session of the course of *"Actualités medico-chirurgicales"* at the *Faculté de médecine de Paris* in March, 1954. The prize is awarded only to amateurs for films not previously published, not subsidized and not produced by any laboratory or firm. Films will be judged on their instructional as well as their cinematographic qualities. They may be of the silent or sound variety, in colour or in black and white, but they must be of 16-millimetre size. The last day for reception of films is March 8, 1954. Applications should be sent as soon as possible and be addressed to the Secretary, *La presse médicale*, 120 Boulevard Saint-Germain, Paris.

Deaths.

THE following death has been announced:

LEADLEY.—James Harold Willmott Leadley, on December 7, 1953, at Sydney.

Diary for the Month.

JAN. 5.—New South Wales Branch, B.M.A.: Council Quarterly.
JAN. 6.—Western Australian Branch, B.M.A.: Council Meeting.
JAN. 12.—*New South Wales Branch, B.M.A.*: Executive and Finance Committee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federal Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178 North Terrace, Adelaide): All Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205 Saint George's Terrace, Perth): Norseman Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rate is £5 *per annum* within Australia and the British Commonwealth of Nations, and £6 10s. *per annum* within America and foreign countries, payable in advance.

PUBLISHED WEEKLY

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Registered at the G.P.O., Sydney, for transmission by post as a newspaper.

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Registered at the G.P.O., Sydney, for transmission by post as a newspaper.